

CORRELATES AND PREDICTORS OF DYSFUNCTIONAL EATING ATTITUDES AND  
BEHAVIOURS IN A NON-CLINICAL NEW ZEALAND FEMALE SAMPLE

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## Preface

This work was completed as part of a larger randomised control trial (RCT) investigating whether it is possible to improve the outcome of bulimia nervosa (BN) and binge eating disorder (BED) treatment by enhancing either the cognitive component or the nutritional component of standard cognitive behavioural therapy.

As part of the collaborative data collection in this group, I was responsible for screening, setting up appointments with and conducting research assessments of twenty five women in the non-clinical group. I administered structured clinical interviews which incorporated the following:

1. Structured Clinical Interview for DSM-IV (SCID; First, Spitzer, Gibbon and Williams, 2002);
2. Eating Disorder Examination -12 (EDE; Cooper, Cooper and Fairburn, 1989);
3. Montgomery Asberg Depression Rating Scale (MADRS, Montgomery and Asberg, 1979).

I also conducted a neuropsychological assessment incorporating the following neuropsychological tests:

4. Tests from the Cambridge Neuropsychological Test Automated Battery (CANTAB; Motor Screening, Rapid Visual Information Processing, Verbal Recall and Recognition Memory (immediate), Verbal Recognition Memory (delayed), Affective Go/No Go, Big Circle/Little Circle, I/ED Shift, Tower of London, Spatial Recognition, Delayed Matching to Sample (parallel mode) and Spatial Working Memory);
5. Trail making test (TMT; Reitan and Wolfson, 1985);
6. National Adult Reading Test (NART; Nelson, 1982).

Assessment of each participant involved approximately four hours. Each participant's data were presented to the research team for the clinical trial and reviewed in order to assess the quality of data collected. Specifically, the research team discussed and reached consensus on items that were difficult to assess in the research assessment as well as on participants' Global Assessment of Functioning (GAF) score from the SCID.

## Table of Contents

Acknowledgements.....	ii
Preface.....	iii
List of Tables .....	viii
Abstract.....	1
Introduction.....	2
<i>Prevalence of Eating Disorders as well as Sub-Threshold Dysfunctional Eating Attitudes and Behaviours .....</i>	<i>2</i>
<i>Overview of Present Study.....</i>	<i>3</i>
<i>Perfectionism and Eating Pathology.....</i>	<i>4</i>
<i>Impulsivity and Eating Pathology .....</i>	<i>9</i>
<i>Self-Esteem and Eating Pathology .....</i>	<i>12</i>
<i>Body Mass and Eating Pathology .....</i>	<i>14</i>
<i>Integrative Models of Risk and Maintenance Factors of Eating Pathology .....</i>	<i>16</i>
<i>Theory behind the Development of Eating Disorder Symptomatology in Non-Clinical Populations.....</i>	<i>19</i>
<i>Continuity versus Discontinuity of Eating Disorders.....</i>	<i>21</i>
<i>Present Study.....</i>	<i>23</i>
Method .....	24
<i>Participants .....</i>	<i>24</i>
<i>Procedure .....</i>	<i>25</i>

<i>Assessment</i> .....	25
<i>Dysfunctional Eating Attitudes and Behaviours</i> .....	25
<i>The Eating Disorders Inventory-II</i> .....	25
<i>Perfectionism</i> .....	27
<i>EDI-II Perfectionism subscale</i> .....	27
<i>Impulsivity</i> .....	28
<i>EDI-II Impulse Regulation subscale</i> .....	28
<i>Self-Esteem</i> .....	28
<i>Rosenberg Self-Esteem Scale</i> .....	28
<i>Body Mass</i> .....	28
<i>Body Mass Index</i> .....	28
<i>Ethical Approval</i> .....	29
<i>Data Analyses</i> .....	29
<i>Results</i> .....	30
<i>Description of the Sample</i> .....	30
<i>Comparisons with Published Norms on Measures</i> .....	31
<i>Analyses to Examine Hypotheses One to Four</i> .....	31
<i>Discussion</i> .....	33
<i>Summary of Findings</i> .....	33
<i>Findings and Comparison with Other Research</i> .....	33
<i>Perfectionism and Dysfunctional Eating Attitudes and Behaviours</i> .....	33
<i>Impulsivity and Dysfunctional Eating Attitudes and Behaviours</i> .....	34
<i>Body Mass and Dysfunctional Eating Attitudes and Behaviours</i> .....	35

<i>Self-Esteem and Dysfunctional Eating Attitudes and Behaviours</i> .....	35
<i>Decreased Self-Esteem, Increased Perfectionism, Increased Body Dissatisfaction and Their Interactions as Predictors of Bulimic Symptoms</i> .....	36
<i>Strengths and Limitations</i> .....	37
<i>Strengths</i> .....	37
<i>Limitations</i> .....	38
<i>Implications of the Present Study</i> .....	38
<i>Psychological Theory</i> .....	40
<i>Future Research</i> .....	42
References .....	44
Appendix A .....	67
<i>Information Sheet</i> .....	67
Appendix B .....	71
<i>Consent Form</i> .....	71
Appendix C .....	73
<i>Ethical Approval</i> .....	73
Appendix D .....	74
<i>Recruitment Poster</i> .....	74
<i>Self Report Questionnaires Employed in Present Study</i> .....	75

## List of Tables

<i>Table 1 Summary of Demographic Information for Fifty Women without Eating Disorders.....</i>	<i>63</i>
<i>Table 2 Descriptive Statistics for Dependent (Dysfunctional Eating Attitudes and Behaviours) and Independent Variables (Perfectionism, Impulsivity and Self-Esteem) for Fifty Women Without Eating Disorders.....</i>	<i>64</i>
<i>Table 3 Spearman Rank Order Correlations between the Measures of Dysfunctional Eating Attitudes and Behaviours (Drive for Thinness, Bulimic Symptoms and Body Dissatisfaction) and the Independent Variables (Perfectionism, Impulsivity, Self-Esteem and Body Mass) for Fifty Women Without Eating Disorders.....</i>	<i>65</i>
<i>Table 4 Multiple Regression Examining the Contribution of Perfectionism, Body Dissatisfaction and Self-Esteem to Bulimic Symptoms in a Sample of Fifty Women without Eating Disorders.....</i>	<i>66</i>



### Abstract

Eating disorders are among the most common psychological problems faced by women. Perfectionism, impulsivity and poor self-esteem have been identified as significant risk factors for the development and maintenance of eating disorders. Further, elevated body mass has been found to amplify the effect of these risk factors on the development of eating pathology. However, although the symptoms associated with eating disorders have been theorised to lie on a continuum with frank eating disorders at one end and normative eating concerns at the other, there is limited research and findings are mixed about the correlates and predictors of dysfunctional eating attitudes and behaviours in non-clinical populations. The present research contributes to a clearer understanding of risk factors associated with dysfunctional eating attitudes and behaviours in non-clinical populations. Correlational analyses in the present study indicated that dysfunctional eating attitudes and behaviours are associated with increased perfectionism, lowered self-esteem and elevated body mass. Regression analyses identified body dissatisfaction as a significant predictor of bulimic symptomatology. Further research is needed to extend these results. The current study found that dysfunctional eating attitudes and behaviours occur in non-clinical populations and are associated with similar risk factors to those associated with eating pathology in clinical populations. Further, it advocates the need for early detection and intervention of eating disturbances in at risk non-clinical samples, particularly in relation to body image dissatisfaction. Finally, it highlights the need for further research focussing on non-clinical samples in order to more clearly understand the correlates and predictors of dysfunctional eating attitudes and behaviours in these populations.

## Introduction

### *Prevalence of Eating Disorders as well as Sub-Threshold Dysfunctional Eating Attitudes and Behaviours*

Eating disorders are among the most common psychological problems faced by females (e.g. Fairburn, Cooper, Doll, Norman, and O'Connor, 2000). The prevalence of anorexia nervosa (AN) has been investigated mainly in samples of young women in Europe and North America, where the average point prevalence has been 0.3% (Hoek and van Hoeken, 2003; Favaro, Ferrara and Santonastaso, 2004). The lifetime prevalence among adult women has been reported as 0.5%–0.6% in three large population-based surveys in New Zealand (Browne, Wells, Scott et al., 2006), United States (Walters and Kendler 1995) and Canada (Garfinkel et al., 1996). The lifetime prevalence of bulimia nervosa (BN) in adult women has been estimated as 1.1%–2.8% in four large population-based surveys in New Zealand (Bushnell, Wells, Hornblow, Oakley-Browne and Joyce, 1990; Browne et al., 2006), the United States (Kendler et al., 1991) and Canada (Garfinkel et al., 1995). For binge eating disorder (BED), one population-based telephone interview survey of adults in Austria estimated the point prevalence as 3.3% among women (Kinzl, Traweger, Trefalt, Mangweth and Biebl, 1999). Other studies of BED have been limited to specific populations (e.g., young women) or have been based only on questionnaires, rather than personal interviews (Streigel-Moore and Franko 2003; Favaro et al., 2004).

Research highlights that sub-threshold dysfunctional eating attitudes and behaviours are prevalent in non-clinical Western female populations at alarming rates. For example, in one study in the United States, 80% of college women reported being dissatisfied with their bodies (Silberstein, Striegel-Moore, Timko and Rodin, 1984) and 71% of a sample of adolescent girls in Christchurch, New Zealand reported a desire to be thinner than they perceived themselves to be (Fear, Bulik and Sullivan, 1996). Wells, Bushnell, Hornblow,

Joyce and Oakley-Browne (1989) found that in those women who did not conform to the diagnostic criteria for eating disorder, a wide range of disordered eating habits was common. In women aged 18-44 years, lifetime experience of recurrent binge eating was reported by 22.5%, depressed mood and self-deprecating thoughts after bingeing by 10.6%, and use of at least three extreme weight loss measures (e.g. exercising, vomiting or fasting) by 8.2%. Further, Welch and Hall (1990) reported that of the 243 female tertiary students in their study, 43.6% engaged in binge eating at some stage in the past. In addition, Fear et al., (1996) reported high rates of disordered eating behaviours among adolescent girls in Christchurch. Of the 363 girls in the study, 54% reported dieting (most having begun before the age of 13), 38% bingeing, 12% purging, 2.5% using laxatives, and 2.2% using diet pills.

Eating disorders are marked by psychosocial impairment and co-morbid psychopathology, and have the highest levels of treatment seeking, inpatient hospitalisation, suicide attempts, and mortality among the common psychological syndromes (e.g. Newman et al., 1996; Stice, Cameron, Killen, Hayward and Taylor, 1999; Stice, Hayward, Cameron, Killen, and Taylor, 2000). The aforementioned prevalence statistics, therefore, illuminate the need for continuing research focussing both on eating disorders as well as sub-threshold disordered eating attitudes and behaviours.

### *Overview of Present Study*

The present study focuses on dysfunctional eating attitudes and behaviours in a non-clinical New Zealand female population. Factors such as perfectionism, impulsivity, poor self-esteem and elevated body mass have been identified as substantial risk factors in the development and maintenance of eating pathology (Stice, 2002). The present study examines whether these factors are correlated with dysfunctional eating attitudes and behaviours in a non-clinical population. The present study also attempts to replicate Vohs and colleagues' model for predicting bulimic symptomatology (Vohs, Bardone, Joiner, Abramson and

Heatherton, 1999; Vohs et al., 2001). Vohs and colleagues theorise that the interaction between increased perfectionism, increased body dissatisfaction, and lowered self-esteem predicts bulimic symptoms in non-clinical as well as clinical samples.

The following paragraphs summarise available empirical literature focussing on the relationships between the independent variables in the present study (perfectionism, impulsivity, self-esteem and body mass) and dysfunctional eating attitudes and behaviours; examine theoretical models that integrate two or more of the aforementioned independent variables in predicting the development or maintenance of eating pathology; highlight underlying theory relating to the development of dysfunctional eating attitudes and behaviours in a non-clinical population and discuss the recent controversy relating to whether eating pathology is discrete from or on a continuum with sub-threshold dysfunctional eating attitudes and behaviours in a non-clinical population.

### *Perfectionism and Eating Pathology*

Perfectionism has been conceptualised as a uni-dimensional and multi-dimensional construct. Within a uni-dimensional framework, perfectionism is defined as the desire to achieve idealistic goals without making mistakes (Brouwers and Wiggum, 1993; Shafran, Cooper and Fairburn, 2002; Shafran and Mansell, 2001). Perfectionists experience a relentless drive towards achieving unrealistically high standards and accordingly, view 95% achievement as a failure (Franco-Paredes, Mancilla-Diaz, Vazquez-Arevalo, Lopez-Aguilar and Alvarez-Rayon, 2005). The main limitation of the uni-dimensional model, and the main proponent for the multi-dimensional model, is that the uni-dimensional model fails to discriminate between *maladaptive perfectionism* (perfectionistic individuals with an unrealistically high standard, and an inability to accept mistakes) from *adaptive perfectionism* (successful individuals who simply work hard to achieve their goals) (Franco-Paredes et al., 2005).

In a multi-dimensional perspective of perfectionism, Hewitt and Flett (1991) have described three subtypes of perfectionism: *self-oriented*, *socially prescribed* and *other-oriented*. Self-oriented perfectionism is the personal setting of high standards and the scrupulous evaluation of one's own behaviour. Socially prescribed perfectionism involves perceiving high expectations from others, fear of negative evaluation and avoidance of the disapproval of others (Franco-Paredes et al., 2005). Finally, other-oriented perfectionism is characterised by one's unrealistic expectations for others. The main difference among self-oriented perfectionism, other-oriented perfectionism and socially prescribed perfectionism is the object to whom the perfectionistic behaviour is directed or to whom the perfectionistic behaviour is attributed, not the behaviour pattern per se (Hewitt and Flett, 1991). Some research suggests that these three dimensions of perfectionism are congruent with the maladaptive and adaptive concepts of perfectionism, where self-oriented perfectionism reflects adaptive perfectionism, and socially prescribed perfectionism maladaptive perfectionism (Frost, Heimberg, Holt, Mattia, and Neubauer, 1993). Pearson and Gleaves' (2006) confirmatory factor analysis also found that perfectionism comprised three factors: *normal perfectionism* (similar to adaptive perfectionism); *neurotic perfectionism* (similar to maladaptive perfectionism) and orderliness.

Perfectionism has been shown to be a characteristic antecedent of both AN, and to a lesser extent BN, in adult and adolescent populations (Fairburn, Cooper, Doll and Welch, 1999; Forbush, Heatherton and Keel, 2007; Garner, Olmstead and Polivy, 1983; Killen et al., 1994; Tyrka, Waldron, Graber, and Brooks-Gunn, 2002). A meta-analytic review by Stice (2002) concluded that perfectionism played a small but significant role in the development of eating pathology.

In comparison to individuals with other psychiatric disorders, individuals with AN tend to be more perfectionistic in terms of their eating as well as in other areas of their lives

(Bardone-Cone et al., 2006; Shafran et al., 2002). Research suggests that perfectionism is a necessary predisposing risk factor for the development of eating disorders, particularly for AN (Goldner, Cockell, and Srikaneswaran, 2002; Tyrka et al., 2002). Furthermore, many individuals with AN still present with traits of perfectionism after recovery, demonstrating that perfectionism is not just associated with the active phase of AN but a more stable characteristic of those with AN (Bardone-Cone et al., 2006; Polivy and Herman, 2002).

The role of perfectionism in the development and maintenance of bulimic behaviours is unclear. In a study of university students, Forbush et al. (2007) found that perfectionism was strongly related to fasting and purging behaviours. These researchers suggested that the relationship between bingeing and perfectionism is due to the presence of fasting behaviours in individuals who binge. This finding may account for why perfectionism is not a risk factor for individuals with binge eating disorder (BED), in which fasting and purging are generally absent (Forbush et al., 2007).

In non-clinical populations, several studies have found that perfectionism and dysfunctional eating attitudes and behaviours are positively correlated (e.g. Terry-Short, Glynn Owens, Slade, and Dewey, 1995; Cockell et al., 2002; Sutandar-Pinnock, Woodside, Carter, Olmsted, and Kaplan, 2003). For example, in a study of female university students, self-oriented perfectionism was related to AN symptoms, and socially prescribed perfectionism was associated, more broadly, with eating disordered behaviours, including BN symptomatology and appearance concerns (Hewitt, Flett and Edrigger, 1995). It was theorised that individuals who are highly perfectionistic and are part of highly competitive environments, such as ballet dancers and athletes, may exhibit a significantly increased risk for disordered eating compared with individuals who are less perfectionistic and who place themselves in less competitive environments (e.g. Anshel, 2004; Thomas, Keel, and Heatherton, 2005; Schwarz, Gairrett, Aruguete, and Gold, 2005). Schwarz et al., (2005)

suggested that these results may be an artefact of the importance placed on body shape and weight in certain vocational fields such as dancing and athletics.

The relationship between perfectionism and eating pathology, especially the perfectionistic concern over making mistakes, might be due to a fear of not achieving sociocultural appearance ideals (Minarik and Ahrens, 1996). Van den berg and colleagues (2002) found that perfectionism leads to appearance comparison, which leads to body dissatisfaction and, in turn, may lead to eating disturbances. This finding suggests that appearance comparison may be the mechanism by which perfectionism operates on body dissatisfaction and eating disturbances. Moreover, this research purports the early role of perfectionism and illustrates how it may predispose an individual to develop eating disturbance. Research should further examine the relationship between perfectionism and these sociocultural factors, in order to understand the role of perfectionistic beliefs early on in eating disorder development.

For individuals with AN, perfectionism is externalised through their impossible standards of thinness, restriction of food intake and extreme efforts in preventing weight gain (Flett, Hewitt and Dyck, 1989; Hewitt et al., 1995). Franco-Paredes and colleagues (2005) asserted that weight control appears to offer these individuals control of their own body and social approval from peers. In addition, when one fails to meet his or her high standards of dietary restraint, more stringent self demands are imposed, causing concern for both the physical and psychological wellbeing of the individual (Shafran et al., 2002). Halmi et al. (2000) found that women with AN exhibited greater perfectionistic behaviours when their eating disorder was at its worst, suggesting a positive relationship between the severity of the eating disorder and level of perfectionism. Thus, perfectionism may also be a maintaining factor that explains the persistence of eating disorder symptomatology, including a dangerously low weight in AN (Fairburn, Cooper, and Shafran, 2003).

Despite mounting evidence for a positive relationship between perfectionism and eating pathology, several studies have reported non significant associations between perfectionism and eating pathology in people with eating disorders (Alvarez , Franco, Mancilla et al., 2003 as cited in Franco-Paredes et al., 2005), people with symptomatology of eating disorders (Escarria and Haro, 2000 as cited in Franco-Paredes et al., 2005) and populations considered at high risk of development of eating disorders, like dance students (Vazquez, Lopez, Alvarez et al., 2000 as cited in Franco-Paredes et al., 2005). For example, Vazquez et al. (2000) as cited in Franco-Paredes et al. (2005) found no significant group differences on perfectionism, as measured by the *Perfectionism* subscale of the *EDI-II* (Garner, 1991) between female dancers with eating disorders and healthy university females. Further, Hopkinson and Lock (2004) found that female athletes' disordered eating attitudes were positively correlated with their level of perfectionism (as measured by the *Multidimensional Perfectionism Scale* (MPS; Hewitt, Flett, Turnbull-Donovan and Mikail, 1991) but this relationship was stronger in a group of recreational athletes than a group of competitive female university athletes.

Discrepancies in literature about the association between perfectionism and dysfunctional eating attitudes and behaviours may be an artefact of neglecting the multi-dimensional nature of perfectionism (Pearson and Gleaves, 2006). Further, these discrepancies could be reflective of different dimensions of perfectionism being considered (intrapersonal versus interpersonal) when interpreting and reporting results or of researchers using different measures of perfectionism (Franco-Paredes et al., 2005). In order to address these discrepancies as well as to more clearly understand the role of perfectionism in the development and maintenance of eating pathology, researchers advocate the use of multi-dimensional measures of perfectionism, such as the *Perfectionism* subscale of the *EDI-II*)



which taps into both self-oriented and socially prescribed perfectionism (Joiner and Schmidt, 1995; Sherry, Hewitt, Besser, McGee and Flett, 2004).

### *Impulsivity and Eating Pathology*

The term “impulsive” is used colloquially to describe behaviour that occurs without consideration for its consequences. However, uncertainty about the most empirical approach for conceptualising and measuring impulsivity has plagued eating disorder research (e.g., Fischer, Smith, and Anderson, 2003). Impulsivity is widely viewed as a multi-dimensional construct consisting of a number of related dimensions, such as *reward sensitivity* and *rash spontaneity* (Dawe and Loxton, 2004). *Rash spontaneity* has been likened to the aforementioned traditional definition of impulsivity. *Reward sensitivity*, however, reflects individuals’ tendency to engage in approach behaviour and experience positive affect in situations with cues for reward (Dawe and Loxton, 2004).

Patton, Stanford, and Barratt (1995) have identified planning, motor activity, and attention as distinct areas in which individuals may demonstrate impulsivity. *Non-planning impulsivity* is said to involve attitudes and conclusions precipitated by a lack of reflection. *Motor impulsivity* has been likened to hyperactivity due to the need for movement, which may be exacerbated by stress. *Attentional impulsivity* is said to refer to rapid shifts in the focus of attention and can be exacerbated by anxiety. An individual’s impulsivity, therefore, may be thought of as the combination of impulsivity in these distinct areas.

Research sometimes assumes and highlights *cognitive restraint* as the opposite of impulsivity. *Cognitive restraint* has been defined as an individuals’ ability to inhibit their behaviour via their thoughts (Stunkard and Messick, 1985), however, unlike impulsivity, cognitive restraint has been shown to be more strongly associated with compulsive behaviours, such as the restrictive eating patterns seen in AN (restrictive type) than impulsive behaviours, such as the episodes of binge eating characteristic of BN (Claes, Vandereycken

and Vertommen, 2002; Lyke and Spinella, 2003). Lyke and Spinella (2003) found that cognitive restraint was not significantly associated with any aspect of impulsivity (planning, motor or attention), supporting the idea that compulsive and impulsive behaviours are not just opposite ends of the same spectrum, but rather distinct dimensions of behaviour. Results such as these suggest that measures of impulsivity should not incorporate items that measure cognitive restraint.

Impulsivity has been shown to have clear links with eating pathology. As noted earlier, AN (restricting subtype) has generally been associated with behavioural inhibition (or overregulation), whereas eating disorder variants characterised by binge eating and purging (i.e. BN and AN (binge/purge subtype)) have been linked to impulsivity and behavioural disinhibition (Vitousek and Manke, 1994; Claes et al., 2002). Various studies have associated binge/purge syndromes with elevated impulsivity, compared with levels of impulsivity obtained in restrictor and/or non-clinical groups (DaCosta and Halmi, 1992; Fahy and Eiler, 1993; Claes et al., 2002). For example, Rosval et al. (2006) studied the associations between different aspects of impulsivity (poor response inhibition (motoric impulsivity), poor planning (reckless behaviour) and ineffective attentional capacity) and eating pathology (AN and BN). They compared females who met criteria for AN or BN with healthy controls. These researchers found that, compared with non-clinical participants, all eating disordered groups showed attentional problems. However, only women suffering BN or AN-binge purge subtype showed elevations on motoric forms of impulsivity, whereas women with BN were the only group to report tendencies toward reckless behaviour. The authors emphasised the need for impulsivity to be conceptualised as a multi-dimensional construct. Rosval et al., (2006) stressed the idea that specific characteristics of eating pathology tend only to correlate with certain components of impulsivity.

Wonderlich, Connolly and Stice (2004) found that trait impulsivity, measured with traditional personality scales, failed to predict the onset of eating disorder behaviour, but when behavioural constructs associated with impulsivity, such as delinquency or substance abuse, were examined, impulsivity significantly predicted the onset of eating disorder behaviour in most of the analyses conducted. These authors suggested that impulsivity is a significant predictor of the onset of eating disorders, but that this is apparent only when objective behavioural measures of impulsivity are employed.

There is a growing body of evidence that reward driven impulsive behaviour also contributes to bulimic behaviour. For example, in a series of studies using self-report measures of reward sensitivity/drive (measured by the Sensitivity to Rewards subscale of the Behavioural Approach System Scale (BAS-SR; Carver and White, 1994), heightened reward sensitivity was consistently associated with higher levels of dysfunctional eating (Loxton and Dawe, 2001; Dawe and Loxton, 2004) and to distinguish those women with BN from controls (Kane, Loxton, Staiger and Dawe., 2004). Further, Loxton and Dawe, (2001) found that reward sensitivity/drive was a more robust predictor of dysfunctional eating than a maternal history of disordered eating or a dysfunctional family environment.

Impulsivity has been investigated primarily as a risk factor for the development of eating pathology (Spinella and Lyke, 2004) however; some research suggests that impulsivity also affects eating attitudes and behaviours in non-clinical populations. For example, Guerrieri, Nederkoon and Jansen (2007) found that individuals who were more impulsive had a higher food intake and reported significantly more disordered thoughts and behaviours related to eating than those who were less impulsive. Further, Spinella and Lyke (2004) reported that disinhibited eating is positively correlated with attentional and motor impulsivity in non-clinical samples.

In terms of understanding the role of impulsivity in the development and maintenance of dysfunctional eating behaviours, research has found that, as with drugs of abuse, the consumption of food increases dopamine release in the neural reward circuits which increases motivated behaviour in rats and humans (Volkow et al., 2002). Dawe and Loxton (2004) thus suggested that increased vulnerability to binge eating also may involve heightened reward sensitivity/drive. In summary, it is theorised that those individuals who are highly impulsive are both more sensitive to rewards and tend to make more rash/spontaneous decisions than those who are less impulsive (Lowe and Eldredge, 1993; Dawe and Loxton, 2004). Reward sensitivity/drive may play a part in the initiation of binge cravings and desire to binge and the component incorporating rash-spontaneous impulsiveness may contribute to disinhibited behaviour and loss of control during a binge episode, and/or the inability to resist binge cravings (Dawe and Loxton, 2004).

### *Self-Esteem and Eating Pathology*

Self-esteem is the overall evaluation and regard of one's worth. Perceived competence in specific areas that an individual values, such as academic success or physical appearance, influences one's self-esteem (Shisslak, Crago, Renger, and Clark-Wagner, 1998). Although self-esteem has been conceptualised by some as a uni-dimensional construct (Franks and Marolla, 1976; Bardone, Perez, Abramson and Joiner, 2003), others view self-esteem as a culmination of different constructs such as *self-liking* and *self-competence* (Tafrodi and Swann, 1995). According to these authors, *self-liking* is the part of self-esteem that is socially dependent. It reflects one's feelings of being loved, likeable, and socially worthy. *Self-competence*, on the other hand, has been described as the overall sense of oneself as capable, effective, and in control. These subcategories of self-esteem are considered to be substantially distinct because they demonstrate different relationships to theoretically linked constructs, such as perfectionism and dysfunctional eating attitudes and behaviours (Tafarodi and

Swann, 1995). However, empirically, these two dimensions are highly intercorrelated, such that, in specifying the distinctive relationships to each dimension, the other dimension should be held constant (Tafarodi and Swann, 1996).

Low self-esteem is related to increased body dissatisfaction, restrictive dieting and eating disturbances in women and adolescent girls (Button, Sonuga-Barke, Davies, and Thompson, 1996; Fingeret and Gleaves, 2004; Williams and Currie, 2000). A longitudinal study by Button and colleagues (1996) found that low self-esteem at an early age was predictive of later eating pathology in teenage girls. Similarly, research conducted by Hoare and Cosgrove (1998) revealed a strong relationship between low self-esteem and abnormal eating behaviour among adolescents. Not only has low self-esteem been postulated as a risk factor for eating pathology, the Vohs et al. (2001) study suggests that low self-esteem is a key moderating factor in the development of bulimic symptomatology. Low self-esteem and disordered eating attitudes and behaviours have also been found to be associated in non-clinical populations (Button et al., 1996; Tomori and Rus-Makovec, 2000; Vohs et al., 2001). Bardone et al. (2003) found that in a non-clinical female university sample, lower self-competence alone predicted an increase in disordered eating patterns over time. Similarly, Gordon, Denoma, Bardone, Abramson and Joiner (2005) found that in a group of non-clinical females, self-competence emerged as a stronger predictor of change in disordered eating patterns than self-liking, such that lower self-competence was associated with an increase in disordered eating. In addition, research has demonstrated the protective nature of high self-esteem in the established relationship between body dissatisfaction and eating pathology (Fingeret and Gleaves, 2004; Twamley and Davis, 1999). Twamley and Davis (1999) found that when self-esteem was high, women who were dissatisfied with their bodies were less likely to engage in pathological eating behaviours. Given the conjectured protective role of self-esteem, current prevention programmes for eating pathology tend to target low self-

esteem (Pesa, 1999). Following participation in a self-esteem education programme, adolescent girls reported improvements in body image and eating attitudes compared to their levels of eating pathology when the programme started (O'Dea and Abraham, 2000). These changes were also evident in those girls considered most at risk of developing an eating disorder at a 12-month follow up.

Bandura's self-efficacy theory (Bandura, 1977) proposes that a person's beliefs about their abilities affect their emotional reactions, thoughts, and behaviour. Thus, low self-efficacy may contribute to negative feelings of helplessness, which may motivate escape through binge eating (Heatherton and Baumeister, 1991) or may contribute to the all-or-nothing mentality which may lead to a dietary lapse. Further, changes in self-esteem commonly occur during adolescence because of the physical and social changes which happen at this time. Teenage girls may begin to have negative thoughts and feelings about their changing body shape and strive for the thin ideal, especially because the media often portray thinness and weight loss as leading to positive outcomes such as increased self-esteem (Hoare and Cosgrove, 1998).

### *Body Mass and Eating Pathology*

The term body mass refers to a person's weight, expressed in kilograms (kg) or pounds (lb), in proportion to their height, measured in metres (m) or feet and inches (ft and in). Elevated body mass is said to lead to increased social pressure to be thin and body dissatisfaction, which may then result in dieting, negative affect, and consequent increased risk for eating pathology (Cattarin and Thompson, 1994). The pressure from family, friends and the media may range from negative comments about weight to attempts to limit the caloric intake of individuals. Elevated body mass may also contribute to body dissatisfaction, as the culturally defined ideal for attractiveness currently favours thinness (Stice, 2002).

Recent research has highlighted the association between elevated body mass and dysfunctional eating attitudes and behaviours in non-clinical populations (e.g. Wichstrom, 2000; Lynch, Eppers, and Sherrodd, 2004; Vander Wal and Thomas, 2004). Fitzgibbon, Blackman and Avellone (2000) sought to examine at what body mass index (BMI; Beaumont, Al-Alami and Touyz, 1998) body image discrepancy (BD) was reported in a community sample of 389 European, Hispanic, and African American women. In addition, they assessed the trajectory of the BMI–BD relationship as BMI increases by ethnic group. These researchers found no difference in the proportion of women in each ethnic group reporting BD. They also found that body dissatisfaction emerged at differing levels of body mass across the different ethnic groups, and that the effect of increasing body mass produced differing levels of increase in body dissatisfaction across ethnic groups.

Elevated body mass has been shown to predict increases in perceived pressure to be thin, body dissatisfaction, and dieting (Cattarin and Thompson, 1994; Stice, Mazotti, Krebs, and Martin, 1998), although some of these relationships have not been replicated in other studies (Byely, Archibald, Graber and Brooks-Gunn, 2000; Cooley and Toray, 2001). Body mass has been shown to predict the onset of bulimic pathology (Killen et al., 1994) and binge eating (Stice, Presnell, and Spangler, 2002). However, elevated body mass did not predict onset or increases in bulimic symptoms (Cattarin and Thompson, 1994; Cooley and Toray, 2001; Killen et al., 1996; Stice and Agras, 1998) or eating disorder symptoms in clinical and non-clinical samples (Gardner, Stark, Friedman and Jackson, 2000; Graber, Brooks-Gunn, Paikoff, and Warren, 1994; Keel, Fulkerson and Leon, 1997) in other studies. Stice's (2002) meta analysis of the risk and maintenance factors of eating pathology reported that body mass was not a significant maintenance factor for bulimic symptoms.

Weight-related variables have been assessed in seven longitudinal studies, three of which found positive relations with subsequent eating disturbances or disorders. Higher BMI

or higher degree of body fat was positively correlated with subsequent Bulimic Investigatory Test (BITE; Henderson and Freeman, 1987) total scores in the study by Calam and Waller (1998), although it did not significantly predict risk status (defined by high BITE and the Eating Disorders Awareness Test (EAT-26; Schmidt, Ali, Slone, Tiller and Treasure, 1995) scores) 7 years later. However, in this study initial levels of EAT-26 and BITE scores had not been controlled for. Elevated body mass was also predictive of being symptomatic (Killen et al., 1994), or a partial diagnosis, of binge eating (Vollrath et al., 1992). In four other studies, BMI or percentage of body fat at Time 1 was not related to subsequent eating disturbances or caseness (Attie and Brooks-Gunn, 1989; Graber et al., 1994; Killen et al., 1996), although in one of these studies BMI had not been entered separately in the analyses but as part of a set of physical maturation variables. If the aforementioned studies with limitations were not taken into consideration (or counted), two longitudinal studies found higher BMI to be predictive of partial syndromes, whereas three other studies did not support this relationship. Accordingly, higher body mass cannot be classified as a risk factor, and further research is needed to clarify the relationship between elevated body mass and eating pathology (Jacobi, Hayward, deZwann, Kraemer and Agras, 2004). These authors further added that, although the literature examining the relationship between elevated body mass and eating pathology has some important methodological strengths, such as large sample sizes and community-based samples, the large number of putative risk factors tested simultaneously increases the risk of false positive results. Also, as only one study for BN and one study for BED have supported the status of childhood obesity as a retrospective correlate, a replication of these findings is necessary.

#### *Integrative Models of Risk and Maintenance Factors of Eating Pathology*

Vohs and colleagues' (1999) proposed a model in which the interaction between perfectionism, body dissatisfaction, and low self-esteem leads to eating pathology. Their



model theorised that the combination of raised levels of body dissatisfaction and perfectionism result in effective weight control behaviours for individuals with high self-esteem because such individuals are likely to view elevated body mass as a temporary, changeable situation. In contrast, perfectionistic individuals with low self-esteem and raised levels of body dissatisfaction are theorised to interpret elevated body mass as a stable and permanent fact, and thus may respond to this with less effective coping skills, such as adopting dysfunctional eating behaviours. This three-factor model represents an elaboration of an earlier theory that perfectionism is only a risk factor for the development of bulimic pathology if it occurs with body dissatisfaction (Joiner, Heatherton, Rudd & Schmidt, 1997).

In contrast, it has been theorised that, if shape and weight concerns are accompanied with high self-esteem it may be unlikely that an individual will develop an eating disorder, despite being perfectionistic (Goldner et al., 2002). Steele, Corsini, and Wade (2007), however, have questioned the robustness of Goldner and colleagues' (2002) theory. Steele et al. (2007) found a three-way interaction between 'benign' or normal perfectionism, perceived weight status and high self-esteem in predicting an increase in bulimic symptoms over a three-month period. Interestingly this interaction effect was strongest for women who had high self-esteem, possibly suggesting that high self-esteem is insufficient to protect against the development of bulimic symptomatology. However, it is important to consider that because these factors did not predict an increase in those with low self-esteem does not mean that they do not predict BN cross-sectionally or over time, given the differing initial levels of BN symptomatology. Steele et al. (2007) concluded that the confluence of increased perfectionism, lowered self-esteem and increased body dissatisfaction in predicting bulimic symptomatology is not well understood, and further replications of Goldner et al. (2002), Vohs and colleagues' (1999) as well as their own work is needed to more clearly interpret

how and to what extent these factors contribute to the development and maintenance of bulimic symptomatology.

Vohs and colleagues' (1999) model has been shown to predict increases in bulimic symptoms over a five-week (Vohs et al., 2001) and nine-month period among college women (Vohs et al., 1999). However, Shaw Stice and Springer's (2004) study found that Vohs et al.'s (1999) multivariate model for the prediction of bulimic symptomology did not predict the development of bulimic symptoms, despite the use of more sensitive measures, a more severe risk group and a longer follow-up period than the Vohs et al. study (2001). Shaw and colleagues (2004) concluded that this interactive model might not be as robust as previously thought. Subsequent research has also not supported this model (Pearson and Gleaves, 2006; Steele et al., 2007). Bardone-Cone et al. (2006) found that the interactive model of perfectionism, perceived weight status, and self-efficacy predicted the binge eating component of BN in a non-clinical university female population. In particular, women high in perfectionism who felt they were overweight reported the most number of weeks of binge eating only if they had a low sense of self-efficacy. A different pattern of results emerged for inappropriate compensatory behaviours, where the interactive model did not predict these component behaviours of BN, either when only purging behaviours were considered or when purging and non-purging behaviours were combined. Bardone-Cone et al. (2006) commented that their results could be interpreted to mean that the confluence of increased perfectionism, lowered self efficacy and one's own perception of being overweight specifically predicts the binge eating component of BN rather than to all bulimotypic symptoms. As an alternative explanation, these authors offered the theory that certain inappropriate compensatory behaviours (especially vomiting) may develop into escape responses and mood modulating behaviours (from negative feelings potentially arising from the combination of increased perfectionism, feeling overweight, and lowered self-efficacy) later

in the course of the disorder. That is, some research has suggested that vomiting may be initiated as a seemingly practical attempt to counter the effects of a binge, but, over time, become more reinforcing on its own and become a habitual means of mood modulation (Fairburn et al., 2003). Further research is required to better understand the relationship between the key constructs of perfectionism, self-esteem and body dissatisfaction, and whether they predict the onset, development and maintenance of eating pathology.

To date, integrative models have not included two important variables implicated as possible risk factors for eating disorders – impulsivity and elevated body mass. It has been suggested that understanding the development and maintenance of eating pathology can be enhanced through the incorporation of relevant risk factors, such as impulsivity and body mass into the current empirical multivariate models (Stice, 2002; Striegel-Moore and Bulik, 2007).

*Theory behind the Development of Eating Disorder Symptomatology in Non-Clinical Populations*

Sociocultural theorists contend that Western cultural values occupy a principal role in the aetiology of eating disorders and their concomitants (Heinberg, 1996; Rodin, Silberstein and Striegel-Moore, 1984; Striegel-Moore, Silberstein, and Rodin, 1986). Culture is a broad term describing the belief systems and value orientations that influence customs, norms, practices, and social institutions, including psychological processes (language, caretaking practices, media, educational systems) and organisations (media, educational systems) (American Psychological Association [APA], 2003, p. 380). Dimensions of culture include shared beliefs, values, family structure, social structures, communication styles, and traditions (Katz, 1985).

Western culture, also referred to as Euro-American or White culture, broadly

refers to first-world, economically stable cultures, such as the majority culture in New Zealand, that value individualism, competition, rational thinking and decision making, economic displays of status and power, and a patriarchal family structure (Katz, 1985). Additionally, Western culture values and idealizes a thin female physique. Western culture stipulates that, for women, a thin body is ideal, appearance is central to one's value and role in society, and that thinness assures security, intimacy, success, and life satisfaction (Heinberg, 1996; Rodin et al., 1984; Thompson, Heinberg, Altabe, and Tantleff-Dunn, 1999). Western cultural ideals predispose women to become preoccupied with thinness and to be dissatisfied with their bodies because few (if any) attain the extremely thin but highly valued cultural ideal. Experimental research has supported this assertion: A meta-analysis of 25 experimental studies that examined the influence of presentation of thin-ideal media images on body satisfaction found that female participants were significantly more dissatisfied with their bodies after viewing thin media images than after viewing images of average sized models, plus sized models, or inanimate objects (Groesz, Levine, and Murnen, 2002).

According one aspect of the sociocultural model proposed by Stice (1994; 2001), awareness of cultural pressure to be thin leads women to internalize this ideal. However, because the thin-ideal is unattainable for most women, internalisation, in turn, directly leads to body dissatisfaction. According to this model, individuals initiate disordered eating behaviours because of extreme dieting, intense negative affect (with bingeing as an attempt to distract from emotional distress), or both. Recent research supports this model: A covariance structural model assessing the direct and indirect influences of body mass, perceived pressure towards thinness, and internalisation of a thin ideal on body dissatisfaction indicated that perceived pressure to be thin significantly predicted internalisation of the thin ideal, which in turn predicted body dissatisfaction (Stice, Shaw, and Nemeroff, 1998). Additionally, a meta-

analysis of prospective and experimental studies examining risk and maintenance factors for eating pathology found that perceived pressure to be thin predicted dieting, negative affect, body dissatisfaction, onset of binge eating, and bulimic symptoms (Stice, 2002).

Heatherton and Polivy (1992) *spiral model* adds that dieting (emerging from body dissatisfaction, in particular among those with low self-esteem) typically leads to dietary failure, and that successive dietary failures lead to decreased self-esteem and increased negative affect, which, in turn, make future diet failures more likely. According to Heatherton and Polivy's (1992) model, over time, this diet/ negative affect/low self-esteem spiral propels the dieter toward more extreme efforts at weight loss (e.g., more severe restriction, the initiation of purging).

Sociocultural theory does not contend that eating disorders are caused solely by Western culture. It has been noted that only a small percentage of women in Western contexts develop eating disorders (Kuba and Harris, 2001). Furthermore, other contextual variables, such as socioeconomic status, peer socialization, family structure, and self-esteem, affect the development of eating disorders (Kuba and Harris, 2001). However, exposure to a Western culture, which promotes a thin ideal of beauty, does appear to increase the chance of developing eating disorder symptomatology (Polivy and Herman, 2002).

#### *Continuity versus Discontinuity of Eating Disorders*

It has been proposed that the severity and quantity of symptoms associated with eating disorders fall on a continuum. Specifically, there are fundamental similarities between the various eating disorders which are grouped at one end of the continuum, milder forms of dysfunctional eating attitudes and behaviours in the middle, and normative eating concerns at the opposite end (Button and Whitehouse, 1981; Clarke and Palmer, 1983; Polivy and Herman, 1987; Stewart, Carter, Drinkwater, Hainsworth and Fairburn, 2001; Fitzgibbon et al., 2003). For example, Stice, Ziemba, Margolis and Flick (1996) found that in a group of

125 high school and college women, bulimics, sub-threshold bulimics, and controls laid along a continuum on measures of both eating and general psychopathology. Additional support for the continuity model was provided in a study of 920 female high school students. Results showed that the same variables that differentiated those with BN from those with sub-threshold BN symptoms also differentiated those with sub-threshold BN symptoms from controls (Stice and Agras, 1998).

The continuity perspective of eating pathology, however, has been challenged. In contrast to the continuity perspective of eating disorders, the discontinuity perspective argues that individuals who are seen with diagnostic levels of eating pathology are qualitatively different from those with sub-threshold forms of the disorder (Crisp, 1980). There is also support for this perspective (Katzman, Wolchik and Braver, 1984; Ruderman and Besbeas, 1992). For example, Gleaves and colleagues (2000) analysed data from 412 female undergraduates and 201 treatment-seeking bulimic women using a taxometric analysis. Their results supported the discontinuity perspective. Finally, rates of depression and anxiety failed to differentiate between controls, those with sub-threshold BN symptoms and those with BN (Garfinkel et al., 1995).

Data are often contradictory in that certain variables tend to support the continuity model, whereas others support the discontinuity model. Inconsistencies are potentially related to the fact that results differ depending on which aspect of the disorder is tested (Stice et al., 1998). Variables related to core eating pathology (e.g., weight/drive for thinness) versus those related to comorbid psychiatric symptoms (e.g., depression/distress/anxiety) generally support different perspectives. Most work in this area has been conducted with female student populations (Ruderman and Besbeas, 1992; Stice et al., 1998) and has focused predominantly on BN and various comparison groups, including dieters and non-symptomatic individuals (Ruderman and Besbeas, 1992); current dieters, restrained dieters, and unrestrained non-

dieters (Lowe et al., 1996); severe binge eaters, moderate binge eaters, mild binge eaters, and non-binge eaters (Vanderheyden and Boland, 1987); and binge/purgers, binge eaters, and controls (Prather and Williamson, 1988). Lowe and colleagues (2000) suggested that an important step in the continuity/ discontinuity debate would be to assess whether other eating disorders, such as BED, are quantitatively (supporting the continuity perspective), or qualitatively (supporting the discontinuity perspective) different from BN. In addition, limited research exists about the effects of perfectionism, impulsivity, self-esteem and elevated body mass on dysfunctional eating attitudes and behaviours in non-clinical populations. Further examination of a range of cognitive and personality characteristics relating to eating attitudes and behaviours in non-clinical populations is needed to advance understanding about whether the constituent risk factors of eating pathology increase on a continuum or if they are qualitatively different in different subgroups (e.g. Fitzgibbon et al., 2003). Further knowledge about factors that may predispose women to hold dysfunctional eating attitudes and engage in problematic eating behaviours will ultimately assist in the treatment of eating disorders. This information may also aid efforts to prevent the development of eating problems or dysfunctional attitudes that precede frank eating disorders.

### *Present Study*

The present study examined the relationship of perfectionism, impulsivity, self-esteem, and body mass to three measures of dysfunctional eating attitudes and behaviours (drive for thinness, bulimic symptomatology and body dissatisfaction) in a group of New Zealand women without eating disorders. Guided by existing research it was hypothesised that;

1. Perfectionism, impulsivity and body mass would be positively correlated with all three measures of dysfunctional eating attitudes and behaviours.

2. Self-esteem would be negatively correlated with all three measures of dysfunctional eating attitudes and behaviours.
3. Perfectionism would be negatively correlated with self-esteem and with body mass.
4. In accordance with Vohs and colleagues' model of bulimic symptom prediction (1999, 2001), decreased self-esteem, increased perfectionism and increased body dissatisfaction would interact with each other to predict bulimic symptoms.

## Method

### *Participants*

Fifty women aged 16 years or over who did not meet diagnostic criteria for an eating disorder: Anorexia Nervosa (AN), Bulimia Nervosa (BN) or Eating Disorders –Not Otherwise Specified (ED-NOS), including Binge Eating Disorder (BED), were recruited from advertisements placed at selected locations, including supermarkets and libraries. Participation in the study was voluntary. Participants were compensated for their time with vouchers to the value of \$100 for approximately eight hours of participation. Inclusion criteria were as follows;

- I. Female gender
- II. Aged between 16 and 55 years
- III. BMI ( $\text{kg/m}^2$ ) above 17.5

Exclusion criteria were as follows;

- I. Recent large weight change (6.2 kg or more within the last 3 months)
- II. Major physical illness
- III. Current binge eating episodes
- IV. Current purging behaviour
- V. Current or past eating disorder; AN, BN or ED-NOS (including BED)
- VI. Major developmental disorder



VII. Cognitive impairment or head injury

VIII. Currently taking psychotropic medication

### *Procedure*

Participants contacted the present study via telephone. Baseline screening of potential participants consisted of brief telephone screening (approximately five minutes). Participants were screened for suitability for the present study by assessing them using the aforementioned inclusion and exclusion criteria. During this screening, participants were informed of the research protocol. The purpose of assessing a group of healthy adults was outlined as being to learn more about eating attitudes and cognitive functioning in healthy women and how healthy women differ from women with an eating disorder. Those who wished to participate were mailed a copy of the study's Information Sheet and Consent Form (see Appendices A and B respectively). Participants provided written informed consent before beginning the assessment. They were asked to complete self-report questionnaires assessing impulsivity, perfectionism, self-esteem, current social and psychological functioning, as well as eating attitudes and behaviours. Participants' weight and height were also measured.

### *Assessment*

#### *Dysfunctional Eating Attitudes and Behaviours*

##### *The Eating Disorders Inventory-II*

The *Eating Disorders Inventory-II* (*EDI-II*; Garner, 1991) is a widely used self-report measure of eating disorder psychopathology and a measure of eating disturbance. It consists of 91 questions, 64 of which are from the original version of the *EDI* (Garner, et al., 1983) and the remaining 27 from the updated version *EDI-II* (Garner, 1991). The *EDI-II* has 11 subscales: *Drive for Thinness*, *Bulimia*, *Body Dissatisfaction*, *Ineffectiveness*, *Perfectionism*, *Interpersonal Distrust*, *Interceptive Awareness*, *Maturity Fears*, *Asceticism*, *Impulse*

*Regulation and Social Insecurity*. *EDI* scores have been associated with problematic eating behaviour (Bourne, Bryant, Griffiths, Touyz and Beumont, 1998). The *Drive for Thinness*, *Bulimia*, and *Body Dissatisfaction* subscales are most strongly correlated with eating-related pathology (Garner et al., 1983; Hurley, Palmer, and Stretch, 1990), and thus these subscales have been employed in the present study as the measures of dysfunctional eating attitudes and behaviours.

The *EDI-II* has been extensively validated and found to be reliable in both clinical and non-clinical samples. Internal consistency coefficients have been shown to range between 0.83 and 0.93, and the test-retest reliability between 0.79 and 0.95 for all of the subscales (Garner, 1991). The subscales are often scored on a 0 to 3 scoring system, however for this sample the scale is scored from 0 (never) through to 6 (always) to maintain as much individual variation within data as possible. This scoring system has been validated within a non-clinical sample (Garner, 1991).

The *EDI-II Drive for Thinness* subscale measures excessive concern with dieting, preoccupation with weight, and fear of weight gain (Garner, 1991). This subscale comprises seven items, and includes questions such as, “I am terrified of gaining weight” and “I feel extremely guilty after overeating”. Higher scores indicate greater drive for thinness. Internal consistency estimates ( $\alpha$ ) for non-clinical female samples range between 0.81 and 0.91 (Garner, 1991). Rizvi, Stice and Agras (1999) found that this subscale yields adequate test-retest reliability (0.70 over a six year period).

The *EDI-II Bulimia* subscale assesses the tendency to think about and engage in bouts of uncontrollable eating (bingeing) (Garner, 1991). This subscale comprises of seven items, and includes questions such as, “I have gone on eating binges where I felt I could not stop” and “I eat when I am upset”. Higher scores indicate more severe bulimic symptoms. Internal consistency estimates ( $\alpha$ ) for non-clinical female samples range between 0.84 and 0.87

(Holm-Denoma et al., 2005). Rizvi et al. (1999) found that this subscale yields adequate test-retest reliability (0.75 over a six year period).

The *EDI-II Body Dissatisfaction* subscale measures dissatisfaction with the overall shape and with the size of those regions of the body that are of greatest concern to those with eating disorders (i.e., stomach, hips, thighs and buttocks, Garner, 1991). This subscale comprises nine items, and includes questions such as, “I think that my stomach is too big” and “I feel satisfied with the shape of my body” (reverse scored). Higher scores indicate more elevated body dissatisfaction. Internal consistency estimates ( $\alpha$ ) for non-clinical female samples range between 0.91 and 0.93 (Garner, 1991). Rizvi et al. (1999) found that this subscale yields adequate test-retest reliability (0.67 over a six year period).

### *Perfectionism*

#### *EDI-II Perfectionism subscale*

The *EDI-II Perfectionism* subscale measures belief that only the highest standards of personal performance are acceptable and that outstanding achievement is expected by others (Garner, 1991). The *EDI-II Perfectionism* subscale consists of two factors: self-oriented perfectionism (i.e. requiring perfection of oneself) and socially prescribed perfectionism (i.e. perceiving that others are demanding perfection of oneself) (Joiner et al., 1995; Sherry et al., 2004). This subscale comprises six items, and includes questions such as, “I hate being less than best at things”. Higher scores indicate higher perfectionism. Previous research has found that this scale possesses internal consistency in use with non-clinical female samples ( $\alpha = 0.80$ ), and predictive validity (Killen et al., 1994; Vohs et al., 1999). Joiner and Schmidt (1995) found that this subscale yields adequate test-retest reliability over 6 and 12 months (0.64 and 0.68 respectively).

## *Impulsivity*

### *EDI-II Impulse Regulation subscale*

The *EDI-II Impulse Regulation* subscale assesses the tendency toward impulsivity, substance abuse, hostility, destructiveness in interpersonal relationships, and self-destructiveness (Garner, 1991). This subscale comprises eleven items, and includes questions such as, “I say things impulsively that I regret having said”. Higher scores indicate poorer impulse regulation. Garner (1991) reports a high internal consistency for the Impulse Regulation subscale in a sample of non eating disordered women ( $\alpha = 0.79$ ).

## *Self-Esteem*

### *Rosenberg Self-Esteem Scale*

The *Rosenberg Self-Esteem Scale* (*RSE*; Rosenberg, 1965) is a 10 item self-report measure of global self-esteem. Rosenberg defined self-esteem as favourable or unfavourable attitudes to oneself (Rosenberg, 1965, p15). The items are scored on a 4-point scale (Strongly Agree [1], Agree [2], Disagree [3], Strongly Disagree [4]). Individuals are compared using the numerical scores generated, a higher score indicating higher self-esteem. The *RSE* is a widely used measure of self-esteem in the general population. The *RSE* has an internal consistency coefficient ( $\alpha$ ) of 0.82 (Blascovich and Tomaka, 1993), and 6 month test-retest reliability of 0.82 was reported in a non-clinical sample (Gray-Little, Williams and Hancock, 1997). This measure also has low social desirability (0.22) indicating honest reporting in a community sample (Robins, Hendin and Trzesniewski, 2001).

## *Body Mass*

### *Body Mass Index*

Body Mass Index (*BMI*; Beumont et al., 1998) is the most commonly used tool for identifying weight categories; which is a measure of the weight of a person scaled according

to height (weight in kilograms divided by the square of height in metres). Average weight is defined as a *BMI* of 20 - 24.9, overweight as between 25 and 29.9 and obesity as greater or equal to 30 (Palmer, 2003). Participants' height and weight were measured by a research assistant on the clinical trial research team.

### *Ethical Approval*

Ethical approval for this study was granted by the Upper South A Regional Ethics Committee (see Appendix C).

### *Data Analyses*

Data were first entered into the Paradox relational database and then imported into the Statistical Package for the Social Sciences (15.0) (SPSS, 2006). All data analyses were performed using SPSS. Data analyses included descriptive statistics, correlations and multiple linear regression analyses.

Participants' scores on the measure of self-esteem (*RSE-Total* score) were normally distributed. One of the dependent variables (*EDI-II – Bulimia* subscale) had a bimodal distribution and all other variables (dependent and independent) were positively skewed with the majority of the participants reporting little symptomatology. Nonparametric statistics were employed in the current study. Due to the mixed distributions of the variables studied, correlational findings were emphasised over statistical significance.

Descriptive statistics were used to determine the demographic characteristics of the sample. Spearman's rank order correlation coefficients were calculated to assess the relationship between measures of perfectionism, impulsivity, self-esteem, body mass and dysfunctional eating attitudes and behaviours. Multivariate linear regression analyses were conducted to determine the amount of variance in bulimic symptomatology accounted for by perfectionism, self-esteem, body dissatisfaction and the three way interaction between perfectionism, self-esteem, body dissatisfaction. The independent variables (perfectionism,

self-esteem and body dissatisfaction) were centred before being entered into the regression equation, in order to generate meaningful interpretations and to reduce the potential of multicollinearity between the interaction terms and their constituent parts (Aiken and West, 1991). In the first step of the multiple regression analysis, perfectionism, self-esteem and body dissatisfaction were entered into the regression model using the forward method (variables entered one at a time). The order of entering these independent variables into the regression model was varied to ensure that biases due to order of entry did not occur. The results achieved from the different orders of entry for the first step of regression analysis yielded similar results in terms of significance testing. In the second step of the multiple regression, the three independent variables (perfectionism, self-esteem and body dissatisfaction) were entered into a regression model with their two-way interaction terms (perfectionism x body dissatisfaction; perfectionism x self esteem; body dissatisfaction x self esteem) and their three-way interaction term (perfectionism x self-esteem x body dissatisfaction) using the forward method again. The  $p$  value for entering and removing variables from the regression model was  $p < 0.05$ .

## Results

### *Description of the Sample*

Table 1 summarises the demographic characteristics of the sample. The average age of participants in this study was 30 years old. The majority of the sample endorsed New Zealand European ethnicity. Participants had, on average, approximately 15.5 years of education; the majority had never been married and approximately half classified themselves as students.

### *Comparisons with Published Norms on Measures*

Table 2 presents the means, standard deviations, medians and ranges for the three dependent variables (drive for thinness, body dissatisfaction and bulimic symptoms) and the independent variables (perfectionism, impulsivity, self-esteem and body mass).

In the present study, *EDI-II Drive for Thinness, Bulimia, Body Dissatisfaction, Perfectionism* and *Impulse Regulation* subscale scores were within one standard deviation of the published norms for a non clinical female sample (Garner, 1991), with median scores slightly lower than the normed population scores. Similarly, the present sample's total scores on the RSE questionnaire were within one standard deviation of the published norms for a non-clinical New Zealand sample (Rusticus, Hubley and Zumbo, 2004), however the median RSE total score in this study was slightly higher than the population median score.

### *Analyses to Examine Hypotheses One to Four*

Table 3 summarises the correlation analyses between the measures of dysfunctional eating attitudes (drive for thinness, bulimic symptoms and body dissatisfaction) and the independent variables (perfectionism, impulsivity, self-esteem and body mass).

*Hypothesis One: Perfectionism, Impulsivity and Body Mass will be Positively Correlated with All Three Measures of Dysfunctional Eating Attitudes and Behaviours (Drive for Thinness, Body Dissatisfaction and Bulimic Symptoms).*

Hypothesis one was partially supported. There was a significant positive correlation between perfectionism and bulimic symptomatology (see Table 3). In addition, there were significant positive correlations between participants' body mass and two measures of dysfunctional eating attitudes and behaviours (drive for thinness and body dissatisfaction).

*Hypothesis Two: Self-Esteem will be Negatively Correlated with all Three Measures of Dysfunctional Eating Attitudes and Behaviours (Drive for Thinness, Body Dissatisfaction and Bulimic Symptoms).*

Hypothesis two was also partially supported (Table 3). There were significant negative correlations between self-esteem and two measures of dysfunctional eating attitudes and behaviours (drive for thinness and body dissatisfaction).

*Hypothesis Three: Perfectionism will be Negatively Correlated with Self-Esteem and with Body Mass.*

Contrary to hypothesis three, no significant negative correlation was evident.

*Hypothesis Four: In Accordance with Vohs and colleagues' Model of Bulimic Symptom Prediction (1999, 2001), Decreased Self-Esteem, Increased Perfectionism and Increased Body Dissatisfaction will Interact with Each Other to Predict Bulimic Symptoms*

Hypothesis four was not supported. There were no significant interaction effects for self-esteem, perfectionism or body dissatisfaction. There was a significant main effect for body dissatisfaction only with increased body dissatisfaction predicting increased levels of bulimic symptoms (Table 4). Body dissatisfaction accounted for 13% of the variance in bulimic symptoms in the present study.



## Discussion

### *Summary of Findings*

The present study found that dysfunctional eating attitudes and behaviours were associated with increased perfectionism, lowered self-esteem and elevated body mass in a non-clinical female sample. Increased body dissatisfaction was identified as a significant predictor of bulimic symptomatology via regression analyses. The test of the three-way interaction between increased perfectionism, lowered self esteem and increased body dissatisfaction represents the central tenet of Vohs and associates (1999, 2001) etiologic model of bulimic symptom prediction. However, in the present study, the hypothesised three-way interaction term did not show significant predictive effects (Table 4).

### *Findings and Comparison with Other Research*

#### *Perfectionism and Dysfunctional Eating Attitudes and Behaviours*

The present study found that self reported perfectionism was positively associated with bulimic symptoms. This finding is consistent with several previous studies (Joiner et al., 1997; Goldner et al., 2002). However, unlike previous research, the correlations between perfectionism and other measures of dysfunctional eating attitudes and behaviours in the present study (drive for thinness and body dissatisfaction) were not statistically significant. The incongruence between the present study's findings and previous research (e.g. Vohs et al., 2001; Shea and Pritchard, 2007) may be understood within the context of differences in sample characteristics. In the case of the present study, healthy women were recruited from the community rather than from university, which has been the norm for previous studies. It may be that the mechanisms of action affecting eating behaviour in this sample may be qualitatively different from those

affecting a sample of women with clinical presentations of an eating disorder or women from university populations.

### *Impulsivity and Dysfunctional Eating Attitudes and Behaviours*

The present study did not find significant associations between participants' level of impulsivity and any of the three measures of dysfunctional eating attitudes and behaviours. As noted earlier, Spinella and Lyke (2004) as well as Rosval et al. (2006) found that whereas attentional and motor impulsivity are associated with normative hunger and dysfunctional eating, non-planning impulsivity and cognitive restraint are not (Spinella and Lyke, 2004). Considering this, the lack of association between impulsivity and dysfunctional eating attitudes and behaviours may be understood by examining the measure of impulsivity used in the present study. The content of the *EDI-II Impulse Regulation* subscale appears to be more aligned with the concept of cognitive restraint than with motor or attentional impulsivity. For example, the subscale contains items such as "I experience marked mood shifts", "Other people would say I am emotionally unstable" and "I can't get strange thoughts out of my head". These items appear to be more congruent with the concept of cognitive restraint than with motor or attentional impulsivity and thus may be less related to dysfunctional eating attitudes and behaviours than a measure of pure motor and attentional impulsivity might have been. Future research could investigate what constructs or factors the *EDI-II Impulse Regulation* subscale measures, and how these differentially relate to eating pathology. The lack of association between impulsivity and eating pathology in the present study also highlights the need for continuing research to clarify both the most empirical definition of impulsivity in the field of eating disorders as well as the relationship between eating pathology and the different aspects of impulsivity. This study also advocates for the use of measures that distinctly measure the different aspects of

impulsivity in eating pathology research (e.g. Rosval et al., 2006). Had such a measure been used in the present study, it is possible the relationship between impulsivity and eating pathology might have been clearer.

#### *Body Mass and Dysfunctional Eating Attitudes and Behaviours*

The present study found that participants with elevated body mass experienced greater drive for thinness and more body dissatisfaction than those with lower body mass. This is consistent with previous research which showed a positive relationship between body mass and dysfunctional eating attitudes and behaviours in non-clinical populations (e.g. Wichstrom, 2000; Lynch et al., 2004; Vander Wal et al., 2004). These results support the sociocultural theories for the development of eating disorders which posit that elevated body mass leads to increased social pressure to be thin and body dissatisfaction, which may then result in dysfunctional eating attitudes and behaviours (Cattarin and Thompson, 1994; Halmi, Falk, and Schwartz, 1981). Body mass is reported to amplify the impact of other risk factors for the development of eating pathology, e.g. perfectionism (Stice, 2002). These results, thus, speak to the need for preventative educational programs focussed on developing self-esteem based on factors other than body shape or mass. Further, these results highlight the need for the advertising industry to apply guidelines that promote health rather than thinness as the ideal for women.

#### *Self-Esteem and Dysfunctional Eating Attitudes and Behaviours*

The present study found that participants' with lower self reported self-esteem experienced a greater drive for thinness and more body dissatisfaction than participants' with higher self reported self-esteem. This finding is consistent with several previous studies which have found significant negative associations between self-esteem and disordered eating attitudes and behaviours in non-clinical populations (Vohs et al., 2001;

Gordon et al., 2005). These results, similar to those for elevated body mass, support the socio-cultural theory for the development of eating pathology. Raised self-esteem is often paired with the thin ideal in the media (Hoare and Cosgrove, 1998). Thus, it is theorised that if an individual accepts the thin ideal portrayed in the media and perceives themselves to be markedly different to this thin ideal, then they experience lowered self-esteem and are at increased risk for developing dysfunctional strategies to achieve the thin ideal. The results of the present study, therefore, also advocate for a greater focus on health rather than thinness in the media.

*Decreased Self-Esteem, Increased Perfectionism, Increased Body Dissatisfaction and Their Interactions as Predictors of Bulimic Symptoms*

The present study did not provide support for Vohs et al.'s (1999) model of the prediction of bulimic symptoms (increased perfectionism interacting with decreased self-esteem and increased body dissatisfaction to predict bulimic symptoms). In addition, body dissatisfaction was found to predict bulimic symptoms in the present study's sample whereas perfectionism and lowered self-esteem were not. Results from the present study of perfectionism, self-esteem and body dissatisfaction in relation to bulimic attitudes and behaviours overall replicate findings from previous research. Specifically, past studies that have examined whether self-esteem and perfectionism predict increases in bulimic symptoms have also found non significant effects for these factors (Killen et al., 1996; Shaw et al., 2004). Similarly, body dissatisfaction has been found to predict bulimic symptoms in past prospective studies as well as the present study (Killen et al., 1994, 1996; Cooley and Toray, 2001; Stice, 2001; Shaw et al., 2004). It was also noteworthy that the interaction between perfectionism and body dissatisfaction did not predict increases in bulimic symptoms. This null finding was consistent with the results observed in the two prospective tests of this theory (Vohs et

al., 1999, 2001). These findings collectively suggest that Joiner et al.'s (1997) etiologic model of the development of bulimic symptoms (perfectionism is only a risk factor for the development of bulimic pathology if it occurs with body dissatisfaction) does not have predictive validity.

### *Strengths and Limitations*

#### *Strengths*

There is limited research examining the effect of perfectionism, impulsivity, self-esteem and body mass on dysfunctional eating attitudes and behaviours in non-clinical populations. In addition, findings from the existing studies in this area are mixed. This study adds to the small non-clinical eating pathology literature, specifically contributing to current knowledge about factors that may predispose healthy women to hold dysfunctional eating attitudes and to engage in unhealthy eating behaviours. The current study also aids the identification of factors (increased perfectionism, lowered self-esteem, elevated body mass and body image dissatisfaction) that may be targeted in the treatment of disordered eating attitudes and behaviours.

The participants for the present study were recruited from the Christchurch community and the majority identified themselves as New Zealand European (70.8%), with 6.3% identifying as Māori. Data on the ethnic breakdown of Christchurch (Statistics New Zealand Census, 2006) show that the majority of Christchurch residents are New Zealand European (75%) and Maori number 8%. This sample consisted of a similar ethnic breakdown to the actual Christchurch population and shows that ethnically, this sample is representative.

### *Limitations*

A limitation of the present study is the small sample size. A larger sample would give greater power to detect associations, if they exist between variables. The small sample size necessitates caution in interpreting results from regression analyses.

The sample consisted of a majority of participants with tertiary education, with the average years of education being 15.5 years. The sample in the present study was more representative of university educated women than those from the general community, and thus limits the generalisability of the results. Women from college samples have been found to be more likely to engage in unhealthy weight loss behaviours than women from groups with less education (Spinella and Lyke, 2004). Higher socioeconomic groups are also the most likely to be dieting and a proportion of these dieters engage in unhealthy eating behaviours (Spinella and Lyke, 2004).

The study relies on a large number of correlational analyses. Conclusions based on these correlational analyses need to be viewed with some caution. A relationship between variables can be determined but this does not provide information on the causal direction or on mechanisms.

A further limitation is the lack of a measure of attentional and motor impulsivity. Previous studies reporting significant relationships between impulsivity and dysfunctional eating attitudes and behaviours have used measures assessing behavioural rather than cognitive or trait impulsivity (e.g. Wonderlich et al., 2004)

### *Implications of the Present Study*

This research has shown that dysfunctional eating attitudes and behaviours are associated with perfectionism, low self-esteem and elevated body mass in a non-clinical female sample. Sub-clinical eating disturbances are not often the focus of research or clinical attention. The current study indicates, however, that these disturbances do occur

in non-clinical samples and are associated with similar risk factors as those associated with eating pathology in clinical populations (Stice, 2002). This similarity lends support to the idea that there exist fundamental similarities between the eating disorders which are grouped at one end of the continuum and milder forms of dysfunctional eating attitudes and behaviours (Button and Whitehouse, 1981; Clarke and Palmer, 1983; Polivy and Herman, 1987; Stewart, et al., 2001; Fitzgibbon et al., 2003).

The findings of this study suggest the need for early detection and intervention of eating disturbances and body image dissatisfaction. As prior research has suggested, when an eating disorder develops into a chronic condition, the impairments and disabilities associated with the disorder have a major impact on the patient's life, which often persists long term (Padierna, Quintana, Arostegui, Gonzalez and Horcajo, 2002; de La Rie, Van Furth, De Koning, Noordenbros, and Donker, 2005). Research such as the present study provides targets for early intervention (e.g. body dissatisfaction) which may protect some at-risk individuals from progressing to significant eating pathology. Further, the association between these underlying risk factors and dysfunctional eating attitudes and behaviours highlights the importance of addressing individual variables such as perfectionism rather than the overt dysfunctional eating attitudes and behaviours when treating sub-threshold or frank eating disorders. The current study also supports further research focussed on perfectionism, self-esteem and body mass in non-clinical samples, in more clearly establishing how these constructs relate to eating pathology.

The present study highlights body dissatisfaction as a significant predictor of bulimic symptomatology. This is a well replicated finding (Killen et al., 1994, 1996; Cooley and Toray, 2001; Stice, 2001; Shaw et al., 2004). The implication of this finding is that health professionals should be vigilant for the presence of body dissatisfaction in non-clinical as well as clinical populations. The current study suggested that this feature

of an individuals' presentation should be assessed thoroughly and addressed in treatment. Further, it is implied that if an individual presents with significant body dissatisfaction, a thorough assessment of bulimic symptomatology should also be conducted.

Finally the present study failed to replicate Vohs et al.'s (1999) interaction model of the prediction of bulimic symptoms. This finding is consistent with several other studies (e.g. Shaw et al., 2004; Persons and Gleaves, 2006). This non replication may be due to the present study having insufficient power to detect effects or to a lack of robustness of Vohs et al. (1999)'s three-way interaction model. As noted earlier, Bardone-Cone et al. (2006) found that the interactive model of perfectionism, perceived weight status, and self-efficacy predicted the binge eating component of BN in a non-clinical university female population but not the compensatory behaviours. This finding implies that the confluence of increased perfectionism, lowered self-esteem and increased body dissatisfaction may be specifically predictive for certain characteristics of BN (e.g. binge rather than purging behaviours) not BN symptomatology as one construct. It may be beneficial, thus, for future research to examine the capacity of the aforementioned confluence of psychosocial variables in predicting specific aspects of BN (e.g. binge versus purge) in non-clinical populations. Additional independent replications of this predictive model will be necessary to illuminate which of these accounts is most accurate.

### *Psychological Theory*

The sociocultural model of eating pathology proposes that awareness of cultural pressure to be thin leads women to internalise this ideal. However, because the thin-ideal is unattainable for most women, internalisation, in turn, directly leads to body dissatisfaction (Stice, 2001). Further, Heatherton and Polivy (1992) have added that



restrictive eating leads to lapses in dieting and even binge episodes. Each such lapse then increases the chances of future lapses, decreased self-esteem and increased negative affect, which, in turn, makes future dysfunctional eating (restrictive or binge) more likely. Over time, it is proposed that this dysfunctional eating pattern/ negative affect/low self-esteem spiral propels individuals toward more extreme dysfunctional eating attitudes and behaviours (e.g., more severe restriction, the initiation of purging).

Findings from the present study marry well with the sociocultural theory of the development of eating disturbances in non-clinical samples. That is, in congruence with the tenets of these theories, body dissatisfaction was found to predict dysfunctional eating attitudes and behaviours. Further, lowered self-esteem and elevated body mass were found to be correlated with dysfunctional eating attitudes and behaviours. However, it is important to note that this study did not explore the factors which contribute to the development of lowered self-esteem in the present sample, therefore, it cannot be assumed that being overweight, sociocultural pressures to achieve the thin ideal or body dissatisfaction predicted lowered self esteem in this sample. To this end, it is noteworthy that, in the present study, self-esteem and body mass were not significantly correlated (Table 3). However, the possibility that sociocultural pressures to be thin significantly contribute to lowered self esteem (especially for women who are or who consider themselves to be overweight) can also not be ruled out without further statistical analyses that explore the predictors of self-esteem in non-clinical female samples. Future research may consider this question.

Finally, it has been noted that the relationship between perfectionism and eating pathology, especially self-oriented perfectionism, might be understood as a fear of not achieving sociocultural appearance ideals (Minarik and Ahrens, 1996). Van den berg and colleagues (2002) found that perfectionism leads to appearance comparison, which

leads to body dissatisfaction and, in turn, may lead to eating disturbances. The present study supports this theory as well, in that increased perfectionism was found to be positively correlated with dysfunctional eating attitudes and behaviours. However, interestingly, the correlation between perfectionism and body dissatisfaction was not significant in the present study (Table 3). This finding may imply that Van den berg et al.'s (2002) findings are not robust, or that the present study did not possess adequate power to detect this relationship. In order to investigate the robustness of Van den berg and colleagues' (2002) findings, it is necessary that future research replicate their work in order to determine whether individual perfectionism leads to dysfunctional eating attitudes and behaviours via appearance comparison or through some other mechanism of action.

#### *Future Research*

The limitations in this present study could be addressed in future research. Replication of the current study with a larger sample is warranted. This would increase the generalisability of results and allow stronger conclusions to be made. Further replication of the current study could also allow a comparison of different samples (such as women of differing ages or men). As noted earlier, a measure of impulsivity that specifically assesses attentional and motoric forms of impulsivity may provide a clearer understanding of the relationship between impulsivity and dysfunctional eating attitudes and behaviours. The present study has highlighted the association between dysfunctional eating attitudes and behaviours and increased perfectionism, lowered self-esteem and elevated body mass in a non-clinical female sample. As noted earlier, it may be beneficial to conduct research examining factors that predict lowered self-esteem in non-clinical female samples, as well as research focussed on elucidating the mechanisms of action through which perfectionism leads to dysfunctional eating attitudes and

behaviours. Answering the aforementioned questions may aid a more direct evaluation the validity of the sociocultural model of the development and maintenance of eating pathology (Stice, 2001; Heatherton and Polivy, 1992; Van den berg et al., 2002) than the present study offers. Future research could also focus on exploring therapeutic strategies to address the underlying risk factors associated with dysfunctional eating attitudes and behaviours. Longitudinal research could assess the comparative effect of treating underlying issues versus treating dysfunctional eating attitudes and behaviours only. Finally, future research could further examine the capacity of increased perfectionism, lowered self-esteem, increased body dissatisfaction and their interaction terms in predicting bulimic symptomatology. Specifically, it may be useful to evaluate how the confluence of these psychosocial variables predicts specific aspects of BN (i.e. binge versus purge behaviours).

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Table 1 Summary of Demographic Information for Fifty Women without Eating Disorders

Demographic Variable	Mean (SD) or %
Age	30.52 (10.59)
Ethnicity	
<i>Māori (n=3)</i>	6.25%
<i>New Zealand European (n=34)</i>	70.83%
<i>Other (n=11)</i>	22.92%
Education (Years)	15.47 (3.08)
Marital status	
<i>Married* (n=18)</i>	37.50%
<i>Separated or Divorced (n=3)</i>	6.25%
<i>Never married (n=27)</i>	56.25%
Employment	
<i>Employed (n=19)</i>	39.58%
<i>Student (n=26)</i>	54.17%
<i>Unemployed or receiving an unemployment benefit (n=3)</i>	6.25%

*\*Married or living together for one or more years*

*Table 2 Descriptive Statistics for Dependent (Dysfunctional Eating Attitudes and Behaviours) and Independent Variables (Perfectionism, Impulsivity and Self-Esteem) for Fifty Women without Eating Disorders*

Construct	Mean (SD)	Median	Range
<i>Drive for Thinness</i>	2.10 (2.54)	1.50	0.00 - 9.00
<i>Bulimic Symptoms</i>	0.34 (0.88)	0.00	0.00 - 3.00
<i>Body Dissatisfaction</i>	9.60 (8.71)	6.50	0.00 - 27.00
<i>Perfectionism</i>	3.29 (3.26)	3.00	0.00 - 12.00
<i>Impulsivity</i>	1.08 (2.74)	0.00	0.00 - 18.00
<i>Self-Esteem</i>	32.58 (5.10)	33.00	19.00 - 45.00
<i>Body Mass</i>	26.56 (5.41)	25.65	18.10 - 46.20



*Table 3 Spearman Rank Order Correlations between the Measures of Dysfunctional Eating Attitudes and Behaviours (Drive for Thinness, Bulimic Symptoms and Body Dissatisfaction) and the Independent Variables (Perfectionism, Impulsivity, Self-Esteem and Body Mass) for Fifty Women without Eating Disorders*

	<i>Drive for Thinness</i>	<i>Bulimic Symptoms</i>	<i>Body Dissatisfaction</i>	<i>Perfectionism</i>	<i>Impulsivity</i>	<i>Self Esteem</i>	<i>Body Mass</i>
<i>Drive for Thinness</i>	-	0.42**	0.37**	-0.07	0.08	-0.45**	0.16
<i>Bulimic Symptoms</i>		-	0.33*	0.35*	0.16	0.02	0.35*
<i>Body Dissatisfaction</i>			-	-0.07	0.05	-0.42**	0.61**
<i>Perfectionism</i>				-	0.08	0.06	-0.19
<i>Impulsivity</i>					-	-0.17	0.10
<i>Self Esteem</i>						-	-0.06
<i>Body Mass</i>							-

\* $p < 0.05$ , \*\*  $p < 0.001$

Table 4 Multiple Regression Examining the Contribution of Perfectionism, Body Dissatisfaction and Self-Esteem to Bulimic Symptoms in a Sample of Fifty Women without Eating Disorders

Order of entry of set	Predictors in set	R <sup>2</sup>				
		<i>F</i> for set	<i>B</i>	<i>SE B</i>	$\beta$	Partial correlation (Adjusted R <sup>2</sup> ) $\Delta R^2$
1	<i>Perfectionism</i>	3.51*	0.26	0.12	0.27	0.31 0.07 (0.05) 0.07
	<i>Body Dissatisfaction</i>		0.32	0.13	0.28*	0.35 0.16 (0.13) 0.09
	<i>Self-Esteem</i>		0.15	0.13	0.04	0.17 0.19 (0.13) 0.03
	<i>Perfectionism</i>	1.95	0.22	0.14	0.25	0.27 0.07 (0.05) 3.76
	<i>Self Esteem</i>		0.12	0.14	0.14	0.04 0.07 (0.03) 0.03
2	<i>Body Dissatisfaction</i>		0.39	0.14	0.45**	0.28 0.19 (0.14) 6.39
	<i>Perfectionism x Self-Esteem</i>		-0.22	0.18	-0.20	-0.06 0.21 (0.14) 1.31
	<i>Perfectionism x Body Dissatisfaction</i>		-0.05	0.15	-0.05	0.02 0.21 (0.12) 0.01
	<i>Body Dissatisfaction x Self Esteem</i>		0.16	0.12	0.18	0.19 0.25 (0.14) 1.94
	<i>Perfectionism x Body Dissatisfaction x Self-Esteem</i>		-0.06	0.18	-0.05	-0.13 0.25 (0.12) 0.10

\* $p<0.05$ , \*\*  $p<0.001$ .

Note. Overall R<sup>2</sup> (Adjusted R<sup>2</sup>) for Model 1 = 0.19 (0.13) and overall R<sup>2</sup> (Adjusted R<sup>2</sup>) for Model 2 = 0.25 (0.12).

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### **Eating and Wellbeing Study**

#### **Introduction**

You are invited to take part in a study of eating and wellbeing being conducted by Virginia McIntosh, Jenny Jordan, Janet Carter, Andrea Bartram, Sarah Rowe, Helen Kleindienst, Peter Joyce, Chloe Hudson and Ruchika Talwar. The major focus of the Eating and Wellbeing Study is to investigate nutritional, endocrine, cognitive and psychological functioning in healthy women volunteers. This study is a companion study to the Binge Eating Psychotherapy Study which is a therapy trial designed to compare the effectiveness of three psychotherapies (talking therapies) for binge eating problems or bulimia nervosa.

You will be part of a group of healthy adult women who will carry out a series of similar assessments to the women with binge eating problems who are participating in the Binge Eating Psychotherapy Study. We will be comparing the results of the two groups' blood samples (particularly levels of hormones related to nutritional status), cognitive task results, self-report questionnaires and interview information.

#### **More about this study**

##### What are the aims of this study?

The purpose of this study is to learn more about the similarities and differences between women with and without binge eating problems. A binge is eating a large amount of food in a short time and feeling out of control while doing so. In particular we will compare hormones levels (including insulin, glucagon, cholecystokinin, leptin and ghrelin) that are potentially related to the regulation of appetite and satiety, as well as cognitive, psychological and personality functioning. Some of these hormones are measured from a small sample of stored blood. With your permission, we may contact you regarding the use of this stored blood sample for additional future study.

##### Who can participate in this study?

Any adult woman (over 16 years old) with no history of binge eating disorder, bulimia nervosa or anorexia nervosa who is medically well and above a body mass index (weight (kgs)/height (m)<sup>2</sup>) of 17.5 (i.e. not severely underweight) may participate in this study. If you are on certain medications you may not be able to take part.

How many participants will be involved?

We hope to study 50 women who do not have binge eating problems and around 200 with binge eating disorders.

Where will the study be held?

This study will be held in the Clinical Research Unit, Terrace House, near Christchurch Hospital, Cnr. Antigua Street & Oxford Terrace. The Clinical Research Unit is jointly funded by the Canterbury District Health Board (CDHB) and the University of Otago's Christchurch School of Medicine and Health Sciences.

What is the time span for the study?

The assessments for this study will occur between 8.30 and 5.00pm on a single day.

What will happen during the study?

If you are interested in taking part in this study a Research Assistant will first ask you some screening questions over the telephone to see if you are eligible to take part, and to give you detailed information about the study. If you are eligible to take part in the study and you wish to do so, the researcher will obtain your written consent to participate in the study. After you have given consent to participate we will ask you to do some self-monitoring and organize the assessment day with you. These are explained in more detail below:

1) Self-monitoring task. We will ask you to record your eating for three days prior to the assessment day.

2) Assessment day (8.30am-5.00pm)

a) Neuroendocrine assessment. The neuroendocrine assessment examines aspects of your body's hormones (including insulin, glucagon, cholecystokinin, leptin and ghrelin) that are potentially related the regulation of appetite and satiety. This assessment will involve coming to the clinical research unit at Terrace House at 8.30am, without having eaten breakfast. During this assessment we will take a series of blood samples while you will be resting comfortably with a needle inserted in a vein. After the first blood samples you will be given a glucose drink, to be drunk within a 5 minute period. We are also interested in your report of hunger, fullness, mood over this time and will ask you to complete self-report questionnaires about eating attitudes, current relationships, and aspects of your childhood and personality during this time. We will be taking about half as much blood as if you have had donated blood and your body will replace this very quickly. The blood sampling will finish at 12.30pm

b) Lunch break. There will be a half an hour lunch break (we will provide a light lunch).

c) Cognitive tasks. We will then ask you to do some cognitive tasks (planning, thinking and memory) on the computer. Most of these will involve trying to remember various patterns that have been shown to you on a computer screen, or finding where certain patterns are hidden on the screen.

Other tasks will involve listening to information that is read to you, then recalling it after a time delay. The tasks take approximately 90 minutes - 2 hours.

e) Interview. Following a short break, you will be asked some questions regarding demographic information and the presence or absence of psychiatric disorders (This takes approximately 90 minute).

Will my GP know I am in the study? If you would like your blood test results sent to your GP we will forward this on

### **Risks and Benefits**

#### What are the risks of participation?

Blood tests can sometimes cause minor discomfort and bruising around the area where the needle is inserted.

#### What are the benefits of participation?

We hope that this study will increase our understanding of the relationship between binge eating and different levels of nutrition-related hormones, and the relationship of these factors to cognitive function, personality and general psychological functioning in women with binge eating disorders and those with no eating disorders.

#### Reimbursement for time and expenses

In view of the time commitment involved in the assessments (approximately 7.5 hours in total for the baseline assessments, as well as the time taken to do the self-monitoring), we will also offer a payment of \$100.00. If you are in receipt of a benefit from Work and Income New Zealand, this payment may result in a reduction of your benefit payment. You should contact Work and Income New Zealand to clarify whether your benefit will be affected by receiving payment for your participation in this research before you consent to participate. If you prefer, we can offer a \$100.00 gift voucher for Westfield Mall.

### **Participation**

- ☐ Your participation in this study is entirely voluntary (your choice).
- ☐ You do not have to answer all questions and you may stop an interview or assessment at any time.
- ☐ If you agree to take part, you are free to withdraw from this study at any time, for any reason.
- ☐ You may bring a friend, family or whanau support to hear about the study, including the risk and/or benefits and any other explanations you require.

### **Disposal of blood samples**

After the study is concluded, blood samples will be disposed of. There are two methods of disposal and participants may choose to have their remaining samples disposed of using standard disposal methods (disposal in accordance with NZS 4304:2002 'Healthcare Waste Management') or if preferred, disposed of with appropriate karakia, at the end of the study.

### **Confidentiality**

We will take all precautions to maintain confidentiality. All forms and computer files will be marked with numbers only, not names. No material that could personally identify you will be used in any reports based on this study. The data from this study will be available only to the study investigators. All data will be stored in secure areas.

### **Results**

How can I obtain results of this research? When this study is over, you may have a summary of the key results. Detailed results will be published in international scientific journals.

### **Compensation**

In the unlikely event of a physical injury as a result of your participation in this study, you may be covered by ACC under the Injury Prevention, Rehabilitation and Compensation Act. ACC cover is not automatic and your case will need to be assessed by ACC according to the provisions of the 2002 Injury Prevention Rehabilitation and Compensation Act. If your claim is accepted by ACC, you still might not receive any compensation. This depends on a number of factors such as whether you are an earner or non-earner. ACC usually provides only partial reimbursement of costs and expenses and there may be no lump sum compensation payable. There is no cover for mental injury unless it is a result of physical injury. If you have ACC cover, generally this will affect your right to sue the investigators.

If you have any questions about ACC, contact your nearest ACC office or the investigator.

**This study has received ethical approval from the Upper South A Regional Ethics Committee.**

### Where can I get more information about the study?

Sarah Rowe may be contacted by telephone or by letter: "Eating and Wellbeing Study", Clinical Research Unit, University Department of Psychological Medicine, Terrace House, 4 Oxford Terrace, Christchurch, 8140. Ph. 372 0400.

Appendix B  
Consent Form



**The Christchurch School of Medicine & Health Sciences**

DEPARTMENT OF PSYCHOLOGICAL MEDICINE

Telephone (03) 372 0400

Fax (03) 372 0407

Clinical Research Unit  
Terrace House  
4 Oxford Tce  
Christchurch

**Eating and Wellbeing Study**

You are invited to take part in a study of eating and wellbeing being conducted by Virginia McIntosh, Janet Carter, Jenny Jordan, Andrea Bartram, Sarah Rowe, Caroline Bray, Chloe Hudson, Ruchika Talwar and Peter Joyce. The purpose of this study is to learn more about the differences between healthy women and those with binge eating problems in their levels of hormones related to appetite and satiety, cognitive, psychological and personality functioning.

I have read and I understand the information sheet dated 4 January 2006 for those taking part in this study.

I have been given the opportunity to discuss this study. I am satisfied with the answers I have been given.

I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time.

I understand that my participation in this study is confidential and that no material that could identify me will be used in any report on this study.

I understand the compensation provisions for this study.

I have had time to consider whether to take part.

I know whom to contact if I have any questions about this study.

I consent to the researchers storing a specimen of my blood (or other tissue) for its later use as a part of this study or other research approved by the Regional Ethics Committee.....YES/NO

I consent to any remaining samples being disposed of using standard disposal methods at the end of the study.....YES/NO

I consent to being re-contacted regarding the use of my stored blood for any additional study.....YES/NO

I wish to have any remaining samples disposed of with appropriate karakia at the end of the study.....YES/NO

I wish to receive a copy of the results of this study..... YES/NO

I understand there will be a significant delay between the information I provide and receiving the results.

I agree to my GP being informed of my participation in this study..... YES/NO GP's

name\_\_\_\_\_

Address\_\_\_\_\_

I would be willing to be contacted to discuss participation in future research in this  
area.....YES/NO

I \_\_\_\_\_(print full name)

hereby consent to take part in this study.

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

Project explained by: \_\_\_\_\_

Phone number: \_\_\_\_\_

Signature of witness: \_\_\_\_\_

Role: \_\_\_\_\_



## Appendix C

### *Ethical Approval*



#### Upper South A Regional Ethics Committee

Ministry of Health  
4<sup>th</sup> Floor, 250 Oxford Terrace  
PO Box 3877  
Christchurch  
Phone (03) 372 3037  
Fax (03) 372 1015

4 January 2007

Professor Peter Joyce  
Department of Psychological Medicine  
Christchurch School of Medicine & Health Sciences  
P O Box 4345  
Christchurch

Attn: Jenny Jordan

Dear Professor Joyce

**Ethics Ref: CTB/04/08/139**  
**Enhancing Psychotherapy for Bulimia Nervosa and Binge Eating Disorder**

Amendment: Request for extension of consent for comparison control group study

Thank you for your response to the Committee's suggestions. Ethical approval is confirmed for the above amendment.

The approved documents are:

- Advertisement dated 4 January 2007
- Information Sheet and Consent Form dated 4 January 2007

Yours sincerely

**Alieke Dierckx**  
Upper South A Ethics Committee Administrator

Appendix D  
*Recruitment Poster*

Ver: 20/03/2007

## Volunteers Wanted for a Study on Eating Attitudes

ARE YOU OVERWEIGHT but not currently dieting and have never had anorexia nervosa or bulimia nervosa?

If so, you may be eligible to participate in our study of biological, personality and eating attitudes in women in the Christchurch community. The assessment will involve a blood test, a computer task, questionnaires and an interview.

You will receive \$100 to compensate you for your time and transport costs.



For more information contact:

**Sarah Rowe**

Christchurch School of Medicine

Ph: (03) 372 0400

E-mail: [sarah.rowe@chmeds.ac.nz](mailto:sarah.rowe@chmeds.ac.nz)

[illegible]









## Rosenberg Self Esteem Scale

## SELF ESTEEM

Self esteem does not mean conceit or being very conscious of your own importance or presence. It simply means valuing yourself in the way that you value others: considering yourself worthwhile, recognising that you are unique individual and that you count just as much as anybody else.

Please read each statement carefully and place in the square the answer which represents your degree of agreement with each statement.

- 1 = STRONGLY AGREE**  
**2 = AGREE**  
**3 = DISAGREE**  
**4 = STRONGLY DISAGREE**

1. On the whole, I am satisfied with myself .....
2. At times I think I am no good at all.....
3. I feel that I have a number of good qualities.....
4. I am able to do things as well as most people.....
5. I feel I do not have much to be proud of.....
6. I certainly feel useless at times.....
7. I feel that I am a person of worth, at least on an equal  
plane with others.....
8. I wish I could have more respect for myself.....
9. All in all, I am inclined to feel that I am a failure.....
10. I take a positive attitude toward myself.....

## The Eating Disorder Examination

### *Interview Schedule*

ID #

--	--	--	--	--

### INTRODUCTION

To begin with I would like to get a general picture of your eating habits over the last 4 weeks.

Have your eating habits varied much from day to day? Have weekdays differed from weekends?

Have there been any days when you haven't eaten anything?

---



---

What about the previous 2 months?

---



---

### PATTERN OF EATING

I would like to ask about your pattern of eating. Over the past 4 weeks which of these meals or snacks have you eaten on a regular basis?

- |   |   |
|---|---|
| - Breakfast (meal eaten shortly after waking) .....                                     | <div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto;"></div> |
| - Mid-morning snack.....  | <div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto;"></div> |
| - lunch (mid-day meal.....  | <div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto;"></div> |
| - mid-afternoon snack .....   | <div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto;"></div> |
| - evening meal .....  | <div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto;"></div> |
| - evening snack.....  | <div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto;"></div> |
| -nocturnal snack (i.e. a snack eaten after the subject has been to sleep..... Rate each | <div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto;"></div> |

meal and snack separately, usually accepting the subject's classification (within the guidelines above). Ask about weekdays and weekends separately. Meals or snacks should be rated even if they lead on to a "binge". "Brunch" should generally be classed as lunch. With this item, rate up (i.e., give a higher rating) if it is difficult to choose between two ratings. Rate 8 if meals or snacks are difficult to classify (e.g., due to shift work).

- 0 - Meal or snack not eaten  
1 -



- 2 - Meal or snack eaten on less than half the days
- 3 -
- 4 - Meal or snack eaten on more than half the days
- 5 -
- 6 - Meal or snack eaten every day

#### RESTRAINT OVER EATING (Restraint subscale)

Over the past 4 weeks have you been consciously trying to restrict what you eat, whether or not you have succeeded?

Has this been to influence your shape or weight?.....

☐

Rate the number of days on which the subject has *consciously attempted* to restrict his or her food intake, whether or not he or she has succeeded. The restraint should have been intended to influence shape, weight, or body composition, although this may not have been the sole or main reason. It should have consisted of planned attempts at restriction, rather than spur-of-the-moment attempts such as the decision to resist second helping.

- 0 - No attempt at restraint
- 1 -
- 2 - Attempted to exercise restraint on less than half the days
- 3 -
- 4 - Attempted to exercise restraint on more than half the days
- 5 -
- 6 - Attempted to exercise restraint every day

#### AVOIDANCE OF EATING (Restraint subscale)

Over the past 4 weeks have you gone for periods of 8 or more waking hours without eating anything?

Has this been to influence your shape or weight?

☐

.....

Rate the number of days on which there has been at least 8 hours abstinence from eating food (soup and milkshakes count as food, whereas drinks in general do not) during waking hours. It may be helpful to illustrate the length of time (e.g. 9 A.M. to 5 P.M.). the abstinence must have been at least partly *self-imposed* rather than being due to force of circumstances. It should have been intended to influence shape, weight, or body composition, although this may not have been the sole or main reason.

- 0 - No such days
- 1 -
- 2 - Avoidance on less than half the days
- 3 -
- 4 - Avoidance on more than half the days
- 5 -
- 6 - Avoidance every day

**EMPTY STOMACH (Restraint subscale)**

**Over the past 4 weeks have you wanted your stomach to be empty? Has this been to influence your shape or weight?**

Rate the number of days on which the subject has had a *definite desire* to have a completely empty stomach for reasons to do with dieting, shape, or weight. This should not be confused with a desire for the stomach to feel empty or be flat.

..... ☐

- 0 - No definite desire to have an empty stomach
- 1 -
- 2 - Definite desire to have an empty stomach on less than half the days
- 3 -
- 4 - Definite desire to have an empty stomach on more than half the days
- 5 -
- 6 - Definite desire to have an empty stomach every day

**FOOD AVOIDANCE (Restraint subscale)**

**Over the past 4 weeks have you tried to avoid eating any foods that you like, whether or not you have succeeded?**

**Has this been to influence your shape or weight?**

..... ☐

Rate the number of days on which the subject has actively *attempted* to avoid eating specific foods (which he or she likes) whether or not he or she succeeded. The goal should have been to *avoid the foods altogether* and not merely to restrict their consumption. Drinks do not count as food. The avoidance should have been intended to influence shape, weight, or body composition, although this may not have been the sole or main reason.

- 0 - No attempts to avoid food
- 1 -
- 2 - Attempted to avoid food on less than half the days
- 3 -
- 4 - Attempted to avoid food on more than half the days
- 5 -
- 6 - Attempted to avoid food every day.

**DIETARY RULES (Restraint subscale)**

**Over the past 4 weeks have you tried to follow certain definite rules regarding your eating, for example, a calorie limit, pre-set quantities of food, or rules about what you should eat or when you should eat?**

..... ☐

**Have there been occasions when you have been aware that you have broken a dietary rule that you have set for yourself? .....**

.....

How have you felt about breaking them? How would you have felt if you had broken one of your dietary rules?

What are these rules? Why have you tried to follow them? Have they been designed to influence your shape or weight?

Have they been definite rules or general principles? Examples of definite rules would be "I must not eat eggs" or "I must not eat cake", whereas you could have the general principle "I should try to eat healthy food".

Dietary rules should be rated as present if the subject has been attempting to follow "definite" (i.e. specific) dietary rules regarding his or her food intake. The rules should have been self-imposed, although originally they may have been prescribed. They should have concerned what the subject should have eaten or when eating should have taken place. They might consist of a calorie limit (e.g., below 1,200 kcals), not eating before a certain time of day, not eating certain types of food, or not eating at all. They should have been specific rules and not general guidelines, and there may have been distress should they have been broken. If the subject is aware that he or she has occasionally broken a personal dietary rule, this suggests that one or more specific rules has been present. In such cases the interviewer should ask in detail about the transgression in an attempt to identify the underlying rule. The rules should have been intended to influence shape, weight, or body composition, although this may not have been the sole or main reason. It should be noted that "*dietary rules*" are regarded as having been present if there have been clear attempts to obey specific dietary rules.

Rate 0 if no dietary rule can be identified. If there has been more than one rule straddling different time periods within the 4 weeks, these periods should be summated to make the rating.

0- Has not attempted to obey such rules

1-

2 - Attempted to obey such rules on less than half the days

3 -

4 - Attempted to obey such rules on more than half the days

5 -

6 - Attempted to obey such rules every day

#### **PREOCCUPATION WITH FOOD, EATING, OR CALORIES (Eating Concern subscale)**

**Over the past 4 weeks have you spent much time between meals thinking about food, eating, or calories?**

**Has thinking about food, eating, or calories interfered with your ability to concentrate? How about concentrating on things that you are interested in, for example, reading, watching television, or following a conversation?**

.....

☐

Concentration is regarded as impaired if there have been *intrusive thoughts about food, eating, or calories that have interfered with activities*. Rate the number of days on which this has happened, whether or not bulimic episodes occurred.

- 0 - No concentration impairment
- 1 -
- 2 - Concentration impairment on less than half the days
- 3 -
- 4 - Concentration impairment on more than half the days
- 5 -
- 6 - Concentration impairment every day

#### **FEAR OF LOSING CONTROL OVER EATING (Eating Concern subscale)**

**Over the past 4 weeks have you been afraid of losing control over eating?**

.....

☐

Rate the number of days on which *definite fear* has been present, irrespective of whether the subject feels he or she has been in control. "*Loss of control*", involves a sense that one will not be able to resist or stop eating. (If the subject feels unable to answer this question because he or she has already lost control rate 8.)

- 0 - No fear of losing control
- 1 -
- 2 - Fear of losing control present on less than half the days
- 3 -
- 4 - Fear of losing control present on more than half the days
- 5 -
- 6 - Fear of losing control every day.

#### **BULIMIC EPISODES AND OTHER (Diagnostic subscale) EPISODES OF OVEREATING**

##### **GUIDELINES FOR INTERVIEWERS**

Four forms of episodic "overeating" are distinguished. The distinction is based upon the presence or absence of two characteristics:

- (i) Loss of control (required for both types of "bulimic episodes")
- (ii) The consumption of what would generally be regarded as a "large" amount of food (required for "objective bulimic episodes" and "objective overeating").

<i>Amount Eaten</i>			
<i>Loss of Control</i>		Large	Not large, but objectively experienced as being too much
	Yes	Objective binge	Subjective binge
	No	Objective overeating	Subjective overeating

The interviewer should ask about each form of overeating. It is important to note that *the forms of overeating are not mutually exclusive*. It is possible for subjects to have had several different forms over the preceding month. With some subjects it is helpful to explain the classificatory scheme. Then, using the probe questions given below, the number of each type of episode may be determined and checked back with the subject.

#### *Definitions of Key Terms*

**“Loss of control”.** The interviewer should ask the subject whether he or she experienced a sense of loss of control over eating *at the time* that the episode occurred. If this is clearly described, loss of control should be rated as present. Loss of control may be rated positively even if the episode had been planned. If the subject uses terms such as “driven to eat” or “compelled to eat”, loss of control should be rated as present.

For chronic cases only: If the subject reports no sense of loss of control yet describes having not been able to stop eating once eating had started or having not been able to prevent the episode from occurring, loss of control should be rated as present. If subjects report that they are no longer trying to control their eating because overeating is inevitable, loss of control should be rated as present.

If the interviewer is in doubt, loss of control should be rated as absent.

**Large amount of food.** The decision whether or not the amount eaten was large should be made by the interviewer and does not require the agreement of the subject. Large may be used to refer to the amount of any particular type of food or the overall quantity of food consumed. *The interviewer should take into account what would be the usual amount eaten under the circumstances.* This requires some knowledge of the eating habits of the subject’s general (but not necessarily) immediate social group. What else was eaten during the day is not of relevance to this rating. The speed of eating and whether or not the subject subsequently spits out or vomits the food are not of relevance.

If the interviewer is in doubt, the amount should not be classified as large.

**The number of episodes of overeating.** When calculating the number of episodes of overeating, the subject’s definition of separate episodes should be accepted unless (within a period of eating) there was an hour or more when the subject was not eating. In this case the initial episodes should be regarded as having been completed. When estimating the length of any gap, do not count the time spent vomiting. *Note that purging (self-induced vomiting or laxative misuse) is not used to define the end of individual episodes of overeating.*

### *Guidelines for Rating the Overeating Section*

First, ask the asterisked questions to identify episodes of perceived or true overeating that have occurred over the previous 28 days. Second, obtain detailed information about each form of overeating to decide whether it involved eating large amounts of food and whether or not there was loss of control (as defined above). Then establish for each form of overeating the number of days on which it occurred and the total number of occasions. It is advisable to make comprehensive notes. Finally, check with the subject to ensure that no misunderstandings have arisen.

#### QUESTIONS FOR RATING ITEMS

*The asterisked questions must be asked in every case. Main Probe Questions*

**\* I would like to ask you about any episodes of overeating that you may have had over the past 4 weeks.**

**\* Different people mean different things by overeating. I would like you to describe any times when you have felt that you have eaten too much in one go.**

**\* Have there been any times when you have felt that you have eaten too much, but others might not agree?**

*If there have been no such times, skip to "social eating".*

*NB. For subjective bulimic episodes to be eligible, they must have been viewed by the patient as having involved an excessive amount of food.*

#### Subsidiary Probe Questions

To assess the amount of food eaten:

Typically what have you eaten at these times? What were others eating at the time?

To assess loss of control:

Did you have a sense of loss of control at the time?

For chronic cases only:

Could you have stopped eating once you had started? Could you have prevented the episode from occurring?

**For objective bulimic episodes, subjective bulimic episodes, and episodes of objective overeating make the following two ratings:**

#### **Objective bulimic episodes**

(i) Number of days (rate 00 if none).....

--	--

(ii) Number of episodes (rate 000 if none).....

--	--	--

**Subjective bulimic episodes**

- (i) Number of days (rate 00 if none)..... (ii)
- Number of episodes (rate 000 if none).....

**Objective overeating episodes**

- (i) Number of days (rate 00 if none).....
- (ii) Number of episodes (rate 000 if none).....

In general, it is best to calculate the number of days first and then the number of episodes. Rate 999 if the number of episodes is so great that their frequency cannot be calculated. Episodes of subjective overeating are not rated.

*Ask about the preceding 2 months.*

For **objective bulimic episodes**, rate the number of episodes over the preceding 2 months and the number of days on which they occurred. Rate 0 if none and leave blank if not asked.

Days:- Month 2 .....

Month 3 ..... Episodes:-

Month 2 .....

Month 3 .....

Also rate the longest continuous period in weeks free (not due to force of circumstances) from objective bulimic episodes over the past 3 months

.....

**DIETARY RESTRICTION OUTSIDE BULIMIC EPISODES (Diagnostic item)**

*Only rate this item if there have been objective bulimic episodes over the past 3 months.*

**Outside the times when you have lost control over eating (refer to objective and subjective bulimic episodes), how much have you been restricting the amount that you eat?**

Typically, what have you eaten?..... Has this been to influence your shape or weight?.....

Month 1.....

Month 2.....

Month 3.....

(Ask about actual food intake outside the objective and subjective bulimic episodes. Rate the *average* degree of dietary restriction. This should have been intended to influence shape, weight, or body composition, although this may not have been the sole or main reason.

- 0 - No extreme restriction outside objective bulimic episodes
- 1- Extreme restriction outside objective bulimic episodes (i.e. low energy intake (□ 1,200 kcal) due to infrequent eating and/or consumption of low-calorie foods)
- 2 - No eating outside objective bulimic episodes (i.e. fasting)

#### **SOCIAL EATING (Eating Concern subscale)**

**Over the past 4 weeks have you been concerned about other people seeing you eat?**

---



---

**Have you avoided such occasions?**

..... (Rate the )

degree of concern about eating normal or less than normal amounts of food in front of others (e.g. family) and whether this has led to avoidance. This should represent the *average* for the entry month. If the possibility of eating with others has not arisen, rate 8. *Do not consider objective bulimic episodes or episodes of objective overeating).*

- 0 - No concern about being seen eating by others and no avoidance of such occasions
- 1 -
- 2 - Has felt slight concern at being seen eating but no avoidance.
- 3 -
- 4 - Has felt definite concern and has avoided some such occasions
- 5 -
- 6 - Has felt definite concern and has avoided all such occasion

#### **EATING IN SECRET (Eating Concern subscale)**

**Over the past 4 weeks have you eaten in secret?**

.....

(Rate the number of days on which there has been at least one episode of secret eating. Secret eating refers to eating that is furtive and which the subject wishes to conceal. Avoidance of eating in front of others should be rated under "Social eating". If the possibility of eating with others has not arisen, rate 8. *Do not consider objective bulimic episodes).*

- 0 - Has not eaten in secret



- 1 -
- 2 - Has eaten in secret on less than half the days
- 3 -
- 4 - Has eaten in secret on more than half the days.
- 5 -
- 6 Has eaten in secret every day

**GUILT ABOUT EATING (Eating Concern subscale) Over**

**the past 4 weeks have you felt guilty after eating?**

**Have you felt that you have done something wrong? Why?**

**On what proportion of the times that you have eaten have you felt guilty?**

.....

(Rate the *proportion of times* on which feelings of guilt have followed eating. These feelings of guilt should relate to the effects of eating on shape, weight, or body composition. *Do not consider objective bulimic episodes*, but do consider other episodes of overeating. *Distinguish guilt from regret*: Guilt refers to a feeling that one has done wrong. *N.B. This rating is based on occasions*).

- 0 - No guilt after eating.
- 1 -
- 2 - Has felt guilty after eating on less than half the occasions
- 3 -
- 4 - Has felt guilty after eating on more than half the occasions
- 5 -
- 6 - Has felt guilty after eating on every occasion

**SELF-INDUCED VOMITING (Diagnostic item)**

***Over the past 4 weeks have you made yourself sick as a means of controlling your shape or weight?***

(Rate the number of days on which there has been one or more episodes of self-induced vomiting as a means of controlling shape, weight, or body composition. Rate 00 if no vomiting.)

.....

(Rate the number of discrete episodes of self-induced vomiting. Accept the subject's definition of an episode. Rate 999 if the number is so great that it cannot be calculated. Rate 000 if no vomiting).

.....

*(Ask about the preceding 2 months if practising self-induced vomiting to influence shape, weight or body composition)*

(Rate the number of discrete episodes of self-induced vomiting over each of the 2 preceding months)

Month 2.....	<div></div>	<div></div>	<div></div>
Month 3.....	<div></div>	<div></div>	<div></div>

.....

**LAXATIVE MISUSE (Diagnostic item)**

**Over the past 4 weeks have you taken laxatives as a means of controlling your shape or weight?**

(Rate the number of days on which laxatives have been taken as a means of controlling shape, weight, or body composition. This should have been the *main* reason, although it may not have been the sole reason. Rate 00 if there was no laxative use or there is doubt whether the laxative taking was primarily to influence shape, weight, or body composition.

.....

Rate the number of individual episodes of laxative misuse (as defined above). Rate 999 if the number is so great that it cannot be calculated. Rate 000 if no such laxative misuse.

.....

Rate the average number of laxatives taken on each occasion. Rate 777 if not quantifiable, e.g., use of bran

.....

Note the type of laxative taken.

.....

*Ask about the preceding 2 months if taking laxatives to influence shape, weight or body composition).*

Rate the number of discrete episodes of laxative misuse over each of the two preceding months. Rate 000 if no such laxative misuse. Rate 999 if not asked.

Month 2.....	<div></div>	<div></div>	<div></div>
Month 3.....	<div></div>	<div></div>	<div></div>

.....

**DIURETIC MISUSE (Diagnostic item)**

**Over the past 4 weeks have you taken diuretics as a means of controlling your shape or weight?**

Rate the number of days on which diuretics have been taken as a means of controlling shape, weight, or body composition. This should have been the *main* reason, although it may not have been the sole reason. Rate 00 if there was no diuretic use or there is no doubt whether the diuretic taking was primarily to influence shape, weight, or body composition.

.....

Rate the number of individual episodes of diuretic misuse (as defined above). Rate 999 if the number is so great that it cannot be calculated. Rate 000 if no such diuretic misuse).

.....

Rate the average number of diuretics taken on each occasion. Rate 999 if not quantifiable).

.....

Note the type of diuretic taken.

\_\_\_\_\_

*Ask about the preceding 2 months if taking diuretics to influence shape, weight or body composition).*

Rate the number of discrete episodes of diuretic misuse over each of the two preceding months. Rate 000 if no such diuretic misuse.

Month 2.....

Month 3.....

\_\_\_\_\_

**INTENSE EXERCISING TO CONTROL SHAPE OR WEIGHT (Diagnostic item)**

**Over the past 4 weeks have you exercised as a means of controlling your weight, altering your shape or amount of fat, or burning off calories?  
Typically, what form of exercise have you taken?**

Rate the number of days on which the subject has engaged in *intense* exercise that was *predominantly* intended to use calories or change shape, weight, or body composition. The decision whether the exercising was "intense" should be made by the interviewer. If in doubt, the exercising should not be classed as intense. Rate 00 if no such exercising.

.....

Rate the *average* amount of time (in minutes) per day spent exercising in this way. Only consider days on which the subject exercised.

.....

Ask about the preceding 2 months if there has been exercising of this type.

Rate the number of days on which the subject has exercised in this manner over each of the two preceding months.

Month 2.....

Month 3.....

### **ABSTINENCE FROM EXTREME WEIGHT-CONTROL BEHAVIOUR** (Diagnostic item)

**Only ask this question if at least one of the key forms of weight-control behaviour has been rated positively at the specified severity level over the past 3 months (at least once weekly for vomiting, laxative use and diuretic use; on more days than not for exercise).**

.....

The five forms of behaviour are as follows:

- fasting
- self-induced vomiting
- laxative misuse
- diuretic misuse
- excessive exercise.

Over the past 3 months has there been a period of 2 or more weeks when you have not.....

Ask as for individual items.

Ascertain the number of consecutive weeks over the past 3 months “free” (i.e. not above threshold levels) from all five forms of extreme weight-control behaviour. Do not use rate abstinence due to force of circumstance.

### **DISSATISFACTION WITH WEIGHT (Weight Concern subscale)**

**Over the past 4 weeks have you been dissatisfied with your weight? Have you been so dissatisfied that it has made you unhappy?**

.....

Only rate dissatisfaction due to weight being regarded as too high. Assess the subject's attitude to his or her weight and rate accordingly. This should represent the *average* for the entire month. Only rate 4, 5 or 6, if there has been distress. Do not prompt with the terms "slight", "moderate" or "marked". rate 9 if the subject is unaware of his or her weight.

- 0 - No dissatisfaction
- 1 -
- 2 - Slight dissatisfaction (no associated distress)
- 3 -
- 4 - Moderate dissatisfaction (some associated distress)
- 5 -
- 6 - Marked dissatisfaction (extreme concern and distress, weight totally unaccepted)

#### DESIRE TO LOSE WEIGHT (Weight Concern subscale)

**Over the past 4 weeks have you wanted to lose weight? Have you had a strong desire to lose weight?**

..... ☐

Rate the number of days on which there has been a *strong desire* to lose weight.

- 0 - No strong desire to lose weight
- 1 -
- 2 - Strong desire present on less than half the days
- 3 -
- 4 - Strong desire present on more than half the days
- 5 -
- 6 - Strong desire present every day

#### DESIRED WEIGHT

**What weight would you like to be?** [Rate weight in kilograms. **Rate 888** if the subject is not interested in his or her weight. **Rate 777** if no specific weight would be low enough. **Rate 666** if the subject is primarily interested in his or her shape but has some concern about weight (but not specific weight).]

.....

#### REACTION TO PRESCRIBED WEIGHING (Weight Concern subscale)

**How would you feel if you were asked to weigh yourself once each week for the next 4 weeks?**

..... ☐

Rate the strength of reaction. Positive reactions should be rated 9. Check whether other aspects of the subject's life would be influenced. Ask the subject to describe in

detail how he or she would react and rate accordingly. Do not prompt with the term “slight”, “moderate” or “marked”. If the subject would not comply with prescribed weighing because it would be extremely disturbing, rate 6.

- 0 - No reaction
- 1 -
- 2 - Slight reaction
- 3 -
- 4 - Moderate reaction (definite reaction, but manageable)
- 5 -
- 6 - Marked reaction (pronounced reaction which would affect other aspects of the subject's life)

#### **DISSATISFACTION WITH SHAPE (Shape Concern subscale)**

**Over the past 4 weeks have you been dissatisfied with your shape? Have you been so dissatisfied that it has made you unhappy?**

..... ☐

Only rate dissatisfaction with shape and not that concerning body tone. Assess the subject's attitude to his or her shape and rate accordingly. This should represent the *average* for the entire month. Only rate 4, 5 or 6, if there has been associated distress. Do not prompt with the terms “slight”, “moderate”, or “marked”.

- 0 - No dissatisfaction with shape
- 1 -
- 2 - Slight dissatisfaction with shape (no associated distress)
- 3 -
- 4 - Moderate dissatisfaction with shape (some associated distress)
- 5 -
- 6 - Marked dissatisfaction with shape (extreme concern and distress, shape totally unacceptable)

#### ***PREOCCUPATION WITH SHAPE OR WEIGHT (Shape***

##### ***Concern and Weight Concern subscales)***

**Over the past 4 weeks have you spent much time thinking about your shape or weight? Has thinking about your shape or weight interfered with your ability to concentrate? How about concentrating on things you are interested in, for example, reading, watching television, or following a conversation?**

..... ☐

Concentration is regarded as impaired if there have been *intrusive thoughts about shape or weight that have interfered with activities*. Rate the number of days on which this happened).

- 0 - No concentration impairment
- 1 -

- 2 - Concentration impairment on less than half the days
- 3 -
- 4 - Concentration impairment on more than half the days
- 5 -
- 6 - Concentration impairment every day.

**IMPORTANCE OF SHAPE (Diagnostic item)**  
**(Shape concern subscale)**

**Over the past 4 weeks has your shape been important in influencing how you feel about (judge, think, evaluate) yourself as a person?**

**If you imagine the things that influence how you feel about (judge, think, evaluate) yourself - (such as your performance at work, being a parent, your marriage, how you get on with other people) - and put these things in order of importance, where does your shape fit in?**

**If, over the past 4 weeks, your shape had changed in any way, would this have affected how you feel about yourself?**

**Is it important to you that your shape does not change?**

..... ☐

Rate the degree of importance the subject has placed on body shape and its position in his or her scheme for *self-evaluation*. To make this rating, comparisons may be made with other aspects of the subject's life that are of importance in his or her scheme for self-evaluation (e.g. quality of relationships, being a parent, performance at work, or leisure activities). The rating should represent the *average* for the entire month. Do not prompt with the terms "some", "moderate", or "supreme". If the subject has regarded both shape and weight as being of equivalent supreme importance, rate 6 on this item and on "Importance of weight".

- 0 - No importance
- 1 -
- 2 - Some importance (definitely an aspect of self-evaluation)
- 3 -
- 4 - Moderate importance (definitely one of the main aspects of self-evaluation)
- 5 -
- 6 - Supreme importance (nothing is more important in the subject's scheme (or self-evaluation)).

---

Ask about the preceding 2 months.

Rate preceding 2 months. Rate 9 if not asked.

Month 2.....

Month 3.....

**IMPORTANCE OF WEIGHT (Diagnostic item)**  
(Weight concern subscale)

**Over the past 4 weeks has your weight been important in influencing how you feel about (judge, think, evaluate) yourself as a person?**

**If you imagine the things that influence how you feel about (judge, think, evaluate) yourself - such as (your performance at work, being a parent, your marriage, how you get on with other people) - and put these things in order of importance, where does your weight fit in?**

**If, over the past 4 weeks, your weight had changed in any way, would this have affected how you feel about yourself?**

**Is it important to you that your weight does not change?**

.....

Rate the degree of importance the subject has placed on weight (i.e. actual or presumed weight) and its position in his or her scheme for *self-evaluation*. To make this rating, comparisons may be made with other aspects of the subject's life that are of importance in his or her scheme for self-evaluation (e.g., quality of relationships, being a parent, performance at work, or leisure activities). The rating should represent the *average* for the entire month. Do not prompt with the terms "some", "moderate", or "supreme". If the subject has regarded both weight and shape as being of equivalent supreme importance, rate 6 on this item and on "Importance of shape".

- 0 - No importance
- 1 -
- 2 - Some importance (definitely an aspect of self-evaluation)
- 3 -
- 4 - Moderate importance (definitely one of the main aspects of self-evaluation)
- 5 -
- 6 - Supreme importance (nothing is more important in the subject's scheme (or self-evaluation)).

Ask about the preceding 2 months.



Rate preceding 2 months. Rate 9 if not asked.

Month 2.....

Month 3.....

**FEAR OF WEIGHT GAIN (Diagnostic item)**  
**(Shape concern subscale)**

*Shorten the question if the subject is obviously overweight.*

**Over the past 4 weeks have you been afraid that you might gain weight (or become fat)?**

.....

Rate the number of days on which a *definite fear* has been present. Exclude reactions to actual weight gain.

0 - No definite fear of fatness or weight gain.

1 -

2 - Definite fear of fatness or weight gain present on less than half the days

3 -

4 - Definite fear of fatness or weight gain present on more than half the days

5 -

6 - Definite fear of fatness or weight gain present every day

Ask about the preceding 2 months. Rate

preceding 2 months.

Month 2.....

Month 3.....

**DISCOMFORT SEEING BODY (Shape concerns subscale)**

**Over the past 4 weeks have you felt uncomfortable seeing your body, for example, in the mirror, in shop window reflections, while undressing, or while taking a bath or shower?**

**Have you avoided seeing your body? Why?**

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☐

The discomfort should be due to the subject's sensitivity about the overall appearance of his or her shape or figure. It should not stem from sensitivity about specific aspects of appearance (e.g., acne) or from modesty.

- 0 - No discomfort about seeing body
- 1 -
- 2 - Some discomfort about seeing body
- 3 -
- 4 - Definite discomfort about seeing body
- 5 -
- 6 - Definite discomfort about seeing body, and has attempted to avoid all such occasions (i.e., the subject has attempted not to see his or her body at all even when washing)

**AVOIDANCE OF EXPOSURE (Shape Concern Subscale)**

**Over the past 4 weeks have you felt uncomfortable about others seeing your body, for example, in communal changing rooms, when swimming, or when wearing clothes that show your shape? What about your partner or friends seeing your body?**

**Have you avoided such situations? Why?** \_\_\_\_\_

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The discomfort should be due to the subject's sensitivity about the overall appearance of his or her shape or figure. It should not stem from sensitivity about specific aspects of appearance (e.g., acne) or from modesty. If the possibility of "exposure" has not arisen, rate 0.

☐

- 0 - No discomfort about others seeing body
- 1 -
- 2 - Some discomfort about others seeing body
- 3 -
- 4 - Definite discomfort about others seeing body
- 5 -
- 6 - Definite discomfort about others seeing body, and has attempted to avoid all such occasions

**FEELINGS OF FATNESS (Diagnostic item)**  
**(Shape Concern Subscale)**

Omit this item if the subject is obviously overweight and rate 7

**Over the past 4 weeks have you felt fat?**

..... ☐

Rate the number of days on which the subject has “felt fat” accepting his or her use of his expression. Distinguish feeling fat from feeling bloated premenstrually, unless this is experienced as feeling fat.

- 0 - Has not felt fat.
- 1 -
- 2 - Has felt fat on less than half the days
- 3 -
- 4 - Has felt fat on more than half the days
- 5 -
- 6 - Has felt fat every day

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Ask about the preceding 2 months.

Rate preceding 2 months.

Month 2..... ☐

Month 3..... ☐

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## FLAT STOMACH (Shape Concern Subscale)

Omit this item if the subject is obviously overweight and rate 7.

**Over the past 4 weeks have you had a definite desire to have a flat stomach?**

..... ☐

Rate the number of days on which the subject has had a *definite desire to have a flat or concave stomach*. Do not rate simply the desire to have a flatter stomach.

- 0 - No definite desire to have a flat stomach
- 1 -
- 2 - Definite desire to have a flat stomach on less than half the days
- 3 -
- 4 - Definite desire to have a flat stomach on more than half the days
- 5 -
- 6 - Definite desire to have a flat stomach every day

## MAINTAINED LOW WEIGHT (Diagnostic item)

*Rate for subjects who may be underweight.*

**Over the past 3 months have you been trying to lose weight?**

**If no: Have you been trying to make sure that you do not gain weight**

☐

.....  
If weight is low, rate presence of attempts either to lose weight or to avoid weight gain.

- 0 - No attempts either to lose weight or to avoid weight gain over the past 3 months
- 1 - Attempts either to lose weight or to avoid weight gain over the past 3 months for reasons concerning shape or weight
- 2 - Attempts either to lose weight or to avoid weight gain over the past 3 months for other reasons

#### **MENSTRUATION (Diagnostic item)**

**Have you missed any menstrual periods over the past few months? How many periods have you had?**

**Are you taking an oral contraceptive (the “pill”)?**

☐

..... With

post-menarchal females, rate number of menstrual periods over the **past three** expected menstrual cycles. Rate 7 if the subject is pre-menarchal, if she has been taking an oral contraceptive, or if she has been pregnant or breast feeding or has had a hysterectomy.